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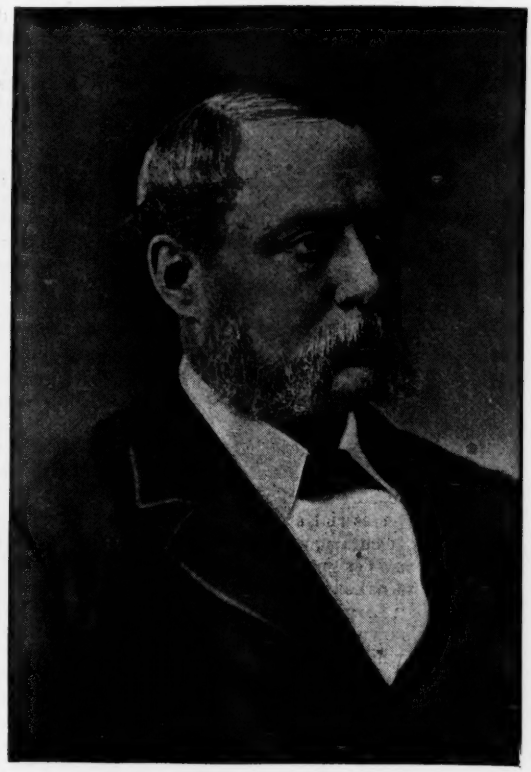

In Memoriam.

RICHARD ANTHONY PROCTOR.

NEW YORK: Sept. 12.

Mr. Richard Proctor, the well-known astronomer, died to-day, at a private hospital in this city, of yellow fever contracted recently in Florida.—*Times*, Sept. 13, 1888.

It was not Yellow Fever

TO the thousands of men and women in both hemispheres whom Proctor's unrivalled powers of exposition and deep knowledge of the things expounded attracted as delighted audience round him both as lecturer and writer, this news in its sad and pregnant brevity brings regret; to the few who knew the man through years of friendship, unchanging, save as it ripened into fellowship, it brings that unredeemed sadness which accompanies irreparable loss.

For myself, who have known Proctor for above twenty years, I can only say that the telegram dazed and sickened me, expecting, as one did, to clasp the hand of my beloved friend within a few days; and now there are tearful faces round a sorely-stricken widow in Florida, there is grief in the hearts of men who cannot cry, and for him

the crowning impotence of death.

The readers of KNOWLEDGE—whose career must probably end with that of its conductor—will gather from the impress of his personality in its pages how much this would make itself even more deeply felt in direct intercourse.

Proctor mixed very little in what is called "society"; he belonged to no club; it is surprising how few of his eminent contemporaries he knew personally. His delight was in his work, his appetite for knowledge was omnivorous, and he was happy in the companionship of wife and children, and of a chosen friend or two with whom to wind up the day over a rubber. He was a good oarsman, an excellent fencer, a doughty champion at chess; last, and not least, he loved a romp with the children.

It was within the social circle—narrow only in number—that the lovableness and simplicity of his character came out; he who, because he hated shams and quacks, of whatever profession, and all their works, was regarded by many outsiders as a querulous and aggressive man, "never at peace unless he was fighting," was seen to be full of kindly considerateness and deference to men of smaller calibre and narrower culture; willing to learn of them, and fretfully anxious if he thought he had said anything that might hurt or vex them.

Of his scientific work, my friend Captain Noble will speak with authority, but I may refer here to the evidence of his unbounded sympathy, to the breadth and variety of his interests, and to his insatiate desire to penetrate to the meaning of facts, which his collected essays and his numerous contributions to this journal supply. What he has done to rescue science from the mechanical hands of the dryasdust class of expositors, and to invest its myriad facts with undying charm, his books testify, and one has fears, although they troubled him so little that they need not trouble us, lest his original work in astronomy, which experts alone are competent to rightly assess, should be obscured by the brilliance of his popular expositions.

Proctor, let me add, was a man of deep religious feeling, looking with no glib complacency upon, or ready with cut-and-dried panaceas for, the sin and sorrow of the world. As with Epicurus, his quarrel was not with the gods, but with men's theories about them. The impressionableness of his nature was evidenced when, prostrate with grief at the loss of a darling boy, he sought refuge in the Catholic Church, and some letters which he wrote to me at that time are charged with the zeal of the proselyte. But the illusion held him not long.

I have said enough where to say anything worthy of the dear dead is difficult. His name is not "writ in water," but linked with happy associations in the memories of the few who knew and loved him, and with gratitude in the hearts of the many whom he led through the Celestial Wonderland. EDWARD CLODD.

BY the untimely death of Richard Anthony Proctor the world loses a man whose rare and extensive gifts are, so far as I am aware, shared by no living astronomer, and a void is left which, just now, it would be impossible to fill. It was in May 1865 that he first

came before the public as a scientific author with his "Saturn and its System," a work which at once stamped him as an acute and original thinker, and as possessing an innate power of popular exposition which was subsequently so marvellously developed in his later works. At first this admirable monograph (which may be read with pleasure and profit for the large amount of general astronomical information it contains, outside of the subject to which it is especially devoted) was a commercial failure. The general public taste was not sufficiently educated at the time to render it, in that sense, a success, although it has since run into a second edition. But to those able to appreciate it, it afforded evidence that a man of mark had arisen in the world of science, and its appearance was speedily followed by the election of its author to the Fellowship of the Royal Astronomical Society, whereof in 1872 he became one of the secretaries, and editor of the *Monthly Notices*. His multifarious engagements, however, and a visit to America compelled him to relinquish these posts somewhat later on. After the publication of his "Saturn," he produced several popular guides to the study of the stellar vault in the shape of his "Handbook of the Stars," "Constellation Seasons," "Half Hours with the Telescope," "Half Hours with the Stars," &c. These were followed in 1870 by a book which at once made its mark, "Other Worlds than Ours"; in which the doctrine of the relative ages of the members of the solar system was developed and enforced, and most of the absurd teleological hypotheses as to the habitability of the planets, &c., set at rest for good and all. The same year witnessed the appearance of his "Sun," in which the mighty centre of our system is treated of in an exhaustive fashion. His "Light Science for Leisure Hours" (a collection of essays largely astronomical) appeared in 1871, as did a second series under the same title in 1873. "The Orbs Around Us," which was published in 1872, may be regarded as a continuation of his "Other Worlds than Ours," of which I have spoken above. In 1873 he gave the first edition of his "Moon" to the world—a work distinguished from his "Sun" by the manner in which the lunar theory was treated at once mathematically and popularly. But much of this went over the heads of the reading public, and in a subsequent edition the mathematical matter has been considerably curtailed. His works on "The Transit of Venus," produced in 1874 and subsequently, must always remain unrivalled as affording the best popular explanation of the nature, use, and character of that phenomenon that has ever been penned; and it will not be forgotten that his profound study of the circumstances under which the transits of 1874 and 1882 would occur enabled him definitely to correct the mistakes into which the (then) Astronomer Royal had inadvertently fallen with reference to the localities whence, and the modes in which, those phenomena would be most advantageously observable. In his "Universe and the Coming Transit," which also appeared in 1874, he developed his theory—originally advanced in an earlier volume—of the physical structure of the visible sidereal universe, and demolished, at once and for ever, the "flat grindstone" hypothesis of the Milky Way, and the ideas as to the relative distances of stars of different magnitudes, which, sanctified by the name of Sir William Herschel, had been copied and recopied into every text-book up to that date. He was the author of the article "Astronomy," in the new edition of the "Encyclopædia Britannica," and he was selected to write the one bearing the same title in the "American Cyclopædia," thereby earning the undying hostility of at least one scientific man on the other side of the Atlantic. He also produced a treatise, but too little read, on "The Geometry of Cycloids." It was, though, to one work, to which he looked to crown his scientific career, that all his previous writings had been ancillary: his "Old and New Astronomy;" and it is piteous to think that death struck the pen from his hand in the very midst of his loving labour at the only worthy original successor to the immortal "Outlines of Astronomy" which has appeared since the death of Sir John Herschel.

The fear intimated above, by my friend Mr. Clodd, that the brilliance of Proctor's popular expositions of science might have the effect of obscuring his original work in astronomy, is certainly not without warrant; for it has been a favourite charge against him by a few ignorant and self-interested people, that he was simply a wonderfully clever expositor of other men's ideas and discoveries. This charge, I have noted, being made by men whose entire books are the merest paste-and-scissors compilations from the works of their predecessors, and whose worn illustrative woodcuts have done duty in text-books over and over and over again. Never was there a greater mistake, or (when deliberately uttered) a greater falsehood. Admitting that Proctor was unrivalled as a popular expositor of the most abstruse discoveries of others; he was very much more than this. He was a born mathematician, and most fertile in expedients, geometrical and analytical, in the solution of problems. I have spoken previously of his "Geometry of Cycloids," and the first edition of his "Moon," and may further advert to his papers scattered through the *Monthly Notices* of the Royal Astronomical Society, as indicative of his capacity for dealing with mathematical questions in an original manner. He applied the differential calculus to the solution of the most ludicrously diverse questions. He devoted great attention to cartography, and many of his maps, both celestial and terrestrial, are unsurpassed for their legibility, convenience, accuracy, and adaptability to the purposes for which they are designed. No existing maps of the stars visible to the naked eye can compare for efficiency with those in his "Larger Star Atlas," with its ingenious projection of his own devising, whereby distortion is sensibly eliminated; while among his latest works his large charts for great circle sailing, and his maps of the world on the equidistant projection, are conspicuous for their beauty and accuracy.

I sat down to attempt a short sketch of Proctor in his scientific capacity. I cannot refrain from adding a word in corroboration of what Mr. Clodd has said about his lovableness. No kinder-hearted man, nor one fuller of innocent fun, ever existed. With the charlatan and the self-advertiser he waged unceasing war. He was too high-minded and conscientious himself to tolerate imposture or deceit in others; and, as far as in him lay, he warned the too-easily deceived public against those who, by self-puffery, were enabled to pose as authorities in a science in which they were simply appropriators of other men's ideas, and jackdaws strutting in borrowed plumes. But to the honest, earnest, and conscientious student he was kindness and gentleness itself; nervously sensitive to the feelings of every one, and but too anxious to apologise if he entertained an idea of having done any one even the slightest injustice. He will be as deeply mourned by those who had the privilege of knowing him personally as he will be missed by the unnumbered thousands in both hemispheres whom he has familiarised with the wonders and beauties of the Celestial Vault.

William Noble.

COMMON CONSENT AND IMMORTALITY.

[There will be found in this number a sketch of the views of several men of science, chiefly American, on the question of immortality. It must not be supposed that this article has any relation to the views expressed in that sketch. Special opinions of that sort, obtained in some cases by more or less urgent inquiry, do not result in indicating common consent. Common consent is, in fact, the opinion which average men form about matters on which abler reasoners have not yet given, perhaps are never likely to give, definite opinions.]

THE argument from general consent has ever been regarded by the unthinking many as of itself proving that the soul of man is immortal. I propose now to remark on the uniform futility of the argument from common consent, associating it with the subject of the immortality of individual life. It is a familiar problem in probabilities to determine how far a report may be trusted when it is received from such and such persons, whose veracity is regarded as respectively so and so. It is vouched for, let us say, by A, who tells truth five times in six, and by B, who tells truth seven times in eleven; while it is contradicted by Y and Z, who tell the truth respectively only once in three times and once in five times; what is the likelihood of its truth, assuming its antecedent probability to be one in ten? I do not say that problems of this type are very useful; for the measures of veracity are not such as we recognise in the actual world. Such problems may be compared to those mechanical ones which are given in college examination papers, where we read of perfectly rigid rods, perfectly uniform substances, frictionless surfaces, and the like: in one case which I can remember (since I was one of the victims of the problem), we were invited to deal with a man whose perfectly smooth spherical head was surmounted by a conical hat of infinite height! But such problems may indicate true principles; and in cases where we can form a fair general idea of the likelihood of a certain conclusion being right as far as each of several points of evidence is concerned, we may infer also, in a general way, the likelihood of its being right when all those several points are considered together.

Now, imagine a community of a thousand persons, each one of whom is invited to decide on some one question of considerable difficulty; and let us suppose that the chance of each one giving the right decision may be averaged at one in ten. When all the results are collected together, it appears, let us say, that an immense majority agree in giving one answer, the rest giving either a different answer or declining to answer at all, on the ground that the question is too difficult for them to decide. Unquestionably in such a case as this, the opinion of most persons (common consent again) would be that the decision of the bulk of the community of a thousand folk was probably right. It is on an assumption of this sort that government by majorities depends, and at a first view it seems right enough. But what are the actual facts? The chance of a right decision in each case is (on the average) the same as that of drawing one white ball from a vase containing ten balls, one only of which is white. If one were told that among the thousand balls severally drawn from a thousand such vases, nine hundred were of one colour—unnamed—would one infer that they must probably be white? Would one not, on the contrary, feel absolutely certain that whatever colour they may be, white they assuredly are *not*? A mathematician, at any rate, would so conclude, for he knows how overwhelming (practically infinite) are the odds against more than one-tenth of the drawn balls being of the colour which appears but once among ten balls in each vase. If all the thousand were announced as of one colour—and this, according to believers in the immortality of the soul, would correspond best with the all but uniform opinion of mankind on that question—the chance that that colour would be further announced to be white would be one in a number represented by one followed by a thousand noughts. If the whole space within our sidereal universe were enlarged a millionfold, and so enlarged, were filled with minute balls closely packed, and so small that a million of them would, together, not be discernible with the most powerful microscope; and if among all these but one where white, the chance of a white ball being drawn from each one of all the thousand vases would be many millions of times less than that of drawing that single white ball at random from that practical infinity of balls of other colours.

Not less unlikely than this—and therefore infinitely unlikely—would it be that a thousand persons would independently agree in giving a right decision on a question where the probability of each concluding right would be as one in ten. And be it remembered that this chance of being right, though small in itself, is great compared with the chance of being right on any question of real difficulty, such, for example, as that of a future life. And on this supremely difficult question not a thousand, but, we are told, all the thousands of millions who have ever thought earnestly about it have been in agreement. It is infinitely more unlikely, then, that their common opinion can be right than even that from the thousand vases of our illustration the white ball should in every case have been drawn.

In passing, I may mention that Friar Bacon was the first, so far as I know, to point out the fallacy underlying the argument from common consent. "With all our strength," he says (in his "Opus Majus," A.D. 1267), "we must prefer reason to custom, and the opinions of the wise and good to the perceptions of the vulgar; and we must not use the triple argument—that is to say, this has been laid down, this is usual, this has been common, *therefore it is to be held by*. For *the very opposite conclusion* does much better follow from the premises. And though the whole world be possessed by these causes of error, let us freely hear opinions contrary to established usage."

It is essential to this argument as to the drawing of correct inferences from common consent, that the matter in question should involve some difficulty, though not necessarily any great difficulty. All men agree that the sun shines, and all men are right, for the shining of the sun is obvious; but in Shakespeare's time all men agreed that the sun is fire, insomuch that he says "doubt that the sun is fire," as he would say, doubt that you live and move; but because that is a matter of less simplicity common consent should have been looked upon with suspicion, and, as a matter of fact, we know now that the sun, whatsoever he may be, is assuredly not fire. In like manner with hundreds of matters which every one who possesses the ordinary senses seems able to deal with, so simple do they appear, yet the common opinion about them, where there has been any real difficulty, has invariably been common error.

For it is by no means necessary, as I have said, that great difficulty should be involved in a question to render universal consent respecting it decisive evidence of error; but in such cases we must recognise the existence of some circumstance or circumstances by which opinion has been biassed. It is practically impossible that *all* the members of a community of a thousand should arrive at a correct conclusion on some question where the chance for each deciding right was so great as nine in ten. If they all agreed, we should have to recognise some bias one way or another, and to decide independently whether that bias was such as to be toward truth or toward error.

It will hardly be denied that the question of the possible

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immortality of man is one of considerable difficulty. The often vaunted fact that even the most cautious men of science will not pronounce immortality to be absolutely impossible proves that the matter is not one to be decided in an instant by average minds. If, then, it is true that average minds have, with scarcely an exception, pronounced in favour of the doctrine of the soul's immortality, we must infer at least a very high degree of probability against the doctrine, if not absolute certainty, that the doctrine is erroneous. Unless, indeed, we can recognise direct evidence in favour of the doctrine, or some reason to believe that opinions would be biassed, and in the direction of the truth.

But we know that the only evidence on which the doctrine has ever been based is that derived from dreams about the dead, which were regarded, very naturally, as indicating the continued existence of the departed in some shadowy or spiritual form. We know now that this evidence has no such meaning as was attributed to it during the childhood of races, and is still attributed to it by children and persons of weak mind.

The evidence of revelation can, of course, not be cited *here*, because the doctrines that there must be a God of such a nature as to take personal interest in man, and that he must have revealed his will to man, belong to those respecting which common opinion has given its most decisive, and, therefore, its almost certainly erroneous verdict.

As regards bias, there can be no doubt that, at the time when men think most of the question of a future life, viz., when some beloved one has passed away, most men desire to entertain the thought that the dead still live in another form, though when they reason about their hope (the few who are able to) they can picture no form of future life in which they could wish their loved ones to be renewed. There is certainly no reason for supposing that bias in this case would be toward truth rather than toward error.

When the most earnest believers in a future life give their reasons for the faith that is in them, we feel still more strongly that such fanciful reasoning cannot be expected to guide men to the truth. I have before me a sermon by the Rev. Mr. Brooks, Doctor of Divinity, in Boston, in which he speaks of a man immediately after death. "That man is dead," he says; "what is it that has come? A minute ago I was talking with him; he was speaking to me of the loves and dreams and imaginings with which I have been familiar, as I have known him this forty years. Now that is stopped. Shall I believe that an end has come to that vitality? The spiritual life is in the powers of the soul, not in the accident which linked them in association with this body in which the physical change has taken place. Shall I believe that they have ceased because it has ceased to be their minister?" To which he answers: "No, because what has passed away is merely the bodily life, not the inner life with its thoughts and emotions." He does not deem it necessary to show that the power of conceiving thoughts or feeling emotions is not as essentially a quality of that which has been destroyed by death, as the power of making fine cloth is a quality of a weaving-machine, and presumably brought to an end by death as the weaving powers of the machine by its destruction. What he says of the man might equally be said, and with about as much reason, of the machine. "A minute ago that machine was weaving beautiful cloth, now it has done its last work, and all its parts will presently be applied to other uses. Shall I believe that the powers of working charming patterns it possessed so short a time since are gone because its mere material structure is to be destroyed? Never; for only the merest accident linked those powers with the machinery!" No answer is needed to one argument any more than to the other. The destroyed machine lives no longer as a piece of mechanism; it can never more produce the delicate textures or the charming patterns which it produced when it existed as a machine. It will live only in its products, direct and indirect. And in like manner, it seems reasonable to believe (though none can say it has been proved), the dead exist no longer as beings capable of feeling or expressing emotions. They live only in their work—in the influences, direct and indirect, which they have produced on those around them during life, or on those who are to come hereafter. This, at any rate—setting aside the rejected evidence of dreams and visions, and what (begging a very large question) is commonly called a revelation (a collection of statements), which is full of errors in less difficult matters—is the conclusion to which reasoning points as the most probable.

Seeing that common consent points to the doctrine that the soul of man—noble creature that the average man has always been—is immortal, we may say that the true argument from common consent proves, almost to demonstration, that the doctrine of the soul's immortality must be one of the common errors into which common consent is bound to fall.

ENGLISH AND AMERICAN TRAITS.

By Richard A. Proctor.*

AMERICA and the Americans have lately been criticised by Mr. Matthew Arnold (who criticised so much) from a philosophic standpoint, and by the Frenchman who, under the pseudonym of Max O'Rell, strove to repay ten years of discomfort in London lodgings and a subordinate position in an English public school by writing a criticism on John Bull [which had to be slightly expurgated before it could be published in English]. Americans seem by one consent to regard Arnold's criticism as harsh, Max O'Rell's as complimentary. Englishmen would for the most part reverse this judgment, considering Arnold's moderate praise as implying much more respect than the Frenchman's compliments, manifestly made with a forward view toward the time when "Jonathan and his Continent" shall be published for comparison with "John Bull and his Island."

Englishmen have long known that the philosopher of "Light and Sweetness" had a sensitive eye for dark places, a taste quick to note the least suspicion of unsweetness. When he told us that our upper classes were materialised, our middle classes vulgarised, our lower classes brutalised, we knew that he saw greys as blackness ever darkening, and that for the lighter ground on which the spots seemed darkened he had scarcely any appreciation. So that when he praised America in matters political and social we knew that "praise from Sir Hubert Stanley" meant singular approval—unless, which some suspected, he praised America to make England more conscious of her shortcomings. But in Matthew Arnold's warmest praise *surgit semper amari aliquid*. Englishmen were not surprised and Americans ought not to be pained if he did not find America in all things superior to the older countries.

Yet what Arnold could not praise in America was still more than Americans themselves had lamented. The only trouble has been, perhaps, that there is always a something of rudeness when men of one country comment on what they deem the faults of another. It seems scarcely less consistent with propriety to say—publicly—of a country one has visited, it has this fault or that, than it would be to comment publicly on the manners or looks of a family with

* In the Louisville *Courier*, Chicago *Inter-Ocean*, and other American papers.

whom one had passed a holiday, or to speak of their home as rough or unfinished, or in this or that way uncomfortable to live in. Apart from this, I think many Americans feel about Mr. Arnold's criticism what the Englishmen have long felt about his philosophy generally—that the lover of light ought not always to take the gloomiest views, the seeker after sweetness should not be always bitter.

The most striking fault as it seems to me in the comparisons which have been made between English and American traits by Englishmen (perhaps by Europeans generally) have been the failure to recognise the difference between the things compared.

An English traveller in America is apt to compare the traits of the classes with which he is familiar in England with the traits of all classes in America—since, if he stays long enough in America to learn something of Americans, he encounters in travelling the whole range of American social life from the best bred to the roughest. The traveller notes more what is new to him—what seems to him strange and unusual. He recalls perhaps, when the question is brought home to him, the well-bred ways, the kindliness, the high intelligence, which he has encountered in those circles where he would expect to find such traits at home. But these are not remembered as part of his travelling experiences. The ill-bred fellow-traveller who spits across him in the cars or makes uncouth noises in his neighbourhood, or talks so loudly about sales and purchases that he can neither read nor converse in comfort—this is the "American" he most vividly recalls; and because in a first-class carriage in England he scarcely ever encounters such persons, whereas in a country where all classes travel together they are familiar experiences, he is apt to describe them as peculiarly American institutions, forgetting that to the classes in England who have fewest opportunities of travelling in America none of these experiences would be at all novel. So in the dining-room and other eating-places of the two countries entirely different classes are encountered. The English visitor in America is apt to relate how this man put his knife into his mouth or that other man dipped his own particular spoon or knife into the cream or butter meant for the general company, because he is unfamiliar with those among the labouring classes in England among whom such practices would not be thought unseemly. He fails to note the behaviour of those Americans who have had the same opportunities as the persons with whom he takes meals when travelling in England. The difference between the ways of the two countries is real enough, but it is not the difference which the average traveller notes; it is simply that in the old country different classes (not necessarily better and worse, or even higher and lower, but having different opportunities in regard to breeding) remain apart, in America they mix freely together.

Similar considerations apply to that which Mr. Arnold with most Englishmen who have visited America regard as the most decided and unanswerable objection against things American—the characteristics of the American newspaper. They fail to notice that the papers which they read in the old country are either expressly intended for their "class," or modelled (through sheer conservatism) on papers so purposed. The London *Times* is as unmistakably prepared for first-class, or at the lowest, second-class readers, as the first-class and second-class carriages in our English train for the upper and middle-class travellers who use them. The *Standard* and the *Daily News*, the *Daily Chronicle*, and *Daily Telegraph*, though cheaper, are as unmistakably modelled on the same lines. (The *Morning Post* has always aimed to be the fashionable paper, and is modelled as if for court folk.) American papers, on the contrary, like American railway cars, are planned to meet the wants of the whole community—and, by the way, so far as "news" is concerned, the American newspapers are as far ahead of the English as the ordinary American railway car is ahead even of the first-class carriages in England in providing for the general comfort of the traveller.

It would be altogether a mistake to suppose that the editors of such papers as the *Tribune*, *World*, *Times*, of New York, and the papers of corresponding position in Philadelphia, Boston, St. Louis, Chicago, Cincinnati, Louisville, &c., sanction, with their personal approval, all the articles which appear in their columns. One might as reasonably infer that Mr. Whitelaw Reid is deeply interested in the achievements of the fellow Sullivan (or who ever chances—I know nothing on the subject—to be the favourite bruiser of the day) or that Mr. Parke Godwin scans with careful scrutiny the records of the base-ball teams.

As American railways are planned on the sound basis of the idea that adult Americans can take care of themselves, so it is with American newspapers. Readers can select what they want.

The American Sunday papers illustrate well the plan on which the American newspapers are worked. I turn to one taken absolutely at random, *The Inter-Ocean*. I am interested in literature; here is literary matter of capital quality in abundance. My friend A. B. is an admirer of the "Ivanhoe" style of novel. Here in the "Outlaws of Tunsthall Forest" he finds any amount of Ivanhoeism, bows and blade, fair maidens and gallant heroes, outlaws and stalwart wardens, with, moreover, old-fashioned mode of speech ("Prithee, where goeth me this road, sirrah?" and the like) as may serve to stir up in him the recollections that though his lot may have been cast in America he is of British and Saxon blood by direct descent. I do not myself care about all forms of sport (though must confess to taking great interest in some), but if I did I should delight in the records I find in this paper. Do quaint stories please? Here is an abundance of them. Or amusing pictures? Here they are, clever, quaint, and capitally illustrative, too, which is quite another matter. (I profess I have laughed for many minutes *sans intermission* at the clever illustrations of my own articles in *The Inter-Ocean*—and strictly between myself and the reader, I think the fun in these pictures (though a philosophy of light and sweetness might solemnly denounce it as a "National misfortune") is something to be grateful for in a world where mouths are too much drawn down at the corners. Does the reader care for science? Well, here is a host of writers (*quorum pars sum*) ready to do their best to make the essence of science pleasing to the general reader. Is religious writing pleasing? Here it is in all forms, from the grave teachings of the older religious school to the denunciations (somewhat vulgar, it must be admitted) of the Sam Joneses and the Talmadges.

If, on the contrary, the reader chooses to turn to those parts of a paper which deal with matters in which he is not interested, and to complain *because* he is not interested, whose fault is it? The answer is obvious. He is not justified in saying, "See what an unintellectual and vulgar people this is; here do their newspapers write of prize-fights and wrestling matches about which I care nothing; here do they describe the features and manners of transatlantic visitors (of whom I am one) in ways which could only interest an unintellectual and vulgar constituency; and here do they publish sermons to which none but the vulgar could listen with patience."

The real difference between the American and the English newspaper is that one provides for the community, the other caters for class only.

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If Englishmen and Americans, both, would try to view things as they really are, instead of taking fanciful and arbitrary notions, we should hear less in the way of mutual recriminations—though mutual praise might not increase correspondingly, since it would be recognised as of the nature of self-praise.

What are Britons, but the race through and by whom chiefly this country was occupied and its advantages developed, and by whom (almost solely) its independence was secured? What are Americans but a nation whose forefathers, chiefly British, came forth from Europe to spread themselves over this land and to become a nation, shaking off in due time forms of control which in Europe cannot well be shaken off without anarchy and disturbance?

For my own part I have never known which event most to admire, from which to draw the best lessons as to the duties of manhood or patriotism—the successful struggle of Britons during a half century to establish their freedom against the mean, self-seeking tyranny of the Stuarts—not one of whom, from "His sowship James I. to the black-hearted James II., was not utterly contemptible—or the more quickly decided struggle of men of British blood to establish independence in America against the coarse but not more contemptible attempts of the Guelphs to grasp what was not their own. Cromwell or Washington, Hampden or Franklin, I know not in which of these, as a man of the same blood, I take the most pride. James I., Charles I., or George III., Charles II. or George IV., I know not which of these seems, in his own special way, more despicable.

Most Englishmen, and nearly all Americans, take an entirely wrong view of the kinship of the two races. They seem to look upon it as something remote, where in reality (as science views it and as common-sense should view it) it is so close that the biologist regards it as almost identity. They speak of Britain as the mother-country, where in reality Americans are as yet but a community of Europeans, chiefly Britons, who have as but yesterday occupied their vast new home; they can no more be regarded as a distinct race than the sparrows, who just now so plague the American farmer, are to be regarded as a distinct family from the twitterers in our London streets.

It may be all very well for Cubans and Mexicans to despise the Spaniard. They belong to a race who, as a whole, were never ready to see things as they are. A race which could persuade itself that burning a man's body for the good of other people's souls was a reasonable proceeding may well persuade themselves that in the course of a few generations the Spanish stock has developed on this side of the Atlantic into a race which can despise that stock fouling its nest and so proving itself an ill bird. But it should be otherwise with sensible people like the British and Americans, full cousins as they are (if not brothers) in the national sense. Facts cannot be altered by feelings or by loud talking. *Cœlum non animum mutant qui trans mare currunt.* I might as reasonably look on my fellow-countrymen on the other side of the Atlantic as of a different race, because I happened to have lived for a few years in America,* as the American of to-day regard his cousins in the old home as another people because a short time ago (yesterday in race-history) some few came out from Britain here and many have since followed them.

But if the folly of fouling the old nest is manifest, the folly of those of the home-staying part of the race who fall foul of American ways as if they were not essentially of British origin should be equally obvious. Men of certain sets come from the old country to mix here with sets unknown to them, though existing (and in large numbers) at home, and what they observe they regard as the unartistic American. Americans, *per contra*, of the more successful sort, therefore above the average presumably in wit and energy, visit the old country and there meet specimens of the less energetic and presumably somewhat dull and quiet-going classes, and denounce the whole family of their cousins as witless and slow.

I have had better opportunities than most men of comparing the two nations; and I profess I find the difference between them even less than I should have expected from the difference in the conditions under which the two nations have subsisted during the last few generations. What I supposed, in the incompleteness of my first few years' information, to indicate characteristic differences, I have found to be no more characteristic (in the national sense) than the differences I find in the ways of my friends the Smiths, who live in the country; in those of my friends the Browns, who live by the river-side; and in those other friends of mine, the Robinsons, who pass the greater part of their time in London.

Britons and Americans may alike depend upon it that if either race is as worthless as the Cuban thinks the Spaniard, and as the Spaniard thinks the Cuban, it is a bad look-out for both. Bad blood produces evil stock.

But it is more pleasant to view the qualities of the two races from the views each forms of his own. If there is life in the good old English blood still, it is good for America, since it is thence the life of the American race came. If Americans have in them the will and power to thrive, it looks well for their English kindred, since they are of the same blood.

Great Britain and America have diverse futures—even though the old country may be able to shake off the dead-weight which the new country left behind it. But it is a sure and certain truth that mutual insults imply common faults, while mutual esteem indicates that each nation respects itself and has faith in its own great future.

* I am not, and never intend to be, a naturalised American citizen.

AMERICAN POLITICS.

AS the word "politician" is understood in America, Americans need no more be concerned by the following remarks than they would by comments reflecting on American pickpockets.

Our British journalists are mostly wide of the mark in their discussion of American politics. They write as if politicians in America really considered in general either the interests of their country on the one hand, or right and justice on the other. These are the things American politicians *talk* about; they are not the things about which they (most of them) *care*. I am not exaggerating in the least; every Englishman who has ever lived in America through a Presidential contest or two will agree to all I say; and so will every American who has kept out of politics, as all the best Americans do, knowing what politics are in their country, in asserting that of ten politicians in America nine would sell the interests of their country ten times over to secure the elections on whose results depend their salaries and their chances of getting ten times their salaries by corrupt means.

The Senate's recent rejection of a treaty which, if unfair at all, was unfair in America's favour, was a typical party matter. An election is approaching which is bound to run close. Last time—that is, in 1884—the Irish vote turned

the scale in Cleveland's favour. The Republicans determined that this should not happen again if they could help it. A move threatening a difficulty with Canada, and therefore with Great Britain, seemed the very thing to secure the Irish vote. Therefore—and for no other reason whatever—the Senate, in which there is a Republican majority, voted for the rejection of the treaty.

But "*à brigand, brigand et demi!*" President Cleveland may be, for aught I know, independent personally of mere party feelings, but in this matter he had to consider the party behind him. If the Senate, by an anti-British move, bids high for the Irish vote, the President bids higher—or, in that gambling slang which presents itself as most appropriate in speaking of American politics, he "goes them one better." "You," he says in effect, "dare only seem to brave Britain by rejecting a reasonable treaty; I am ready to seem to brave Britain by suggesting unreasonable retaliation (by which the United States—but what does that matter?—must suffer much more, in the long run, than Canada or England)." Before the folly of the whole thing (clever though either move may be in a party sense) has been discovered, the election will be over, and neither the elected nor the defeated will care two straws if their counter-party moves have caused loss or suffering, or even disastrous war.

It is the same with the tariff question. I have had the opportunity of ascertaining the views of many Republicans and many Democrats on this subject—really vital to the nation—and I am satisfied that, apart from the absolutely astounding ignorance which prevails among all classes in America respecting every department of the science of political economy, not one Republican in a hundred would be less zealous for low tariff, as any Democrat now pretends to be, if low tariff chanced to be the cry of his party; while not one Democrat in a hundred of those who now urge a lowered tariff would not be loud in outcry for protection if protection chanced to be his party's pretended creed. Neither party, as a party, cares a pin about either protection or free-trade, except as a means of getting votes.

Of the ignorance which I have mentioned—an ignorance accompanied often by dense stupidity—a thousand instances might be cited. Every American ought to know, from his own experience, the essential folly of the principle of protection as adopted and applied in the States. If he buys an article of foreign production—say, for the reason that he cannot get a respectable article of the kind at any price in his own country (as, for example, a surgical instrument, a pocket-knife, a razor, a pair of boots, a suit of clothes, or a packet of writing-paper)—he finds he has so much to pay for the original price, so much for carriage, and so much (a great much) for duty. The price he thus pays is just so much above the price he would have to pay for the American article as to tempt him to buy this article in spite of its inferior quality. But when he pays the price, he knows that the duty (equally with cost price and carriage) is paid out of his own pocket—not out of the foreign manufacturer's—and is added to that surplus in the Treasury at Washington which represents a portion of the tariff's drain on America's life-blood—[not all, quite a large proportion goes to bribe rascally customs' collectors]. Yet the very man who has thus paid out of his own pocket the duty imposed by way of protection, will join, either out of sheer folly, or from interested motives, in the silly cry that the Britisher pays the money which swells the American surplus.

Then, because British papers express satisfaction at the prospect of a lowered tariff (a prospect most delusive), the Republican papers all cry out that America must lose if Great Britain gains. Does America lose when we gain by getting cheap food-supplies from America? Does America lose when Britain gains from peaceful relations, or from fuller assurance of their continuance? Are *none* of the benefits mutual which trade and commerce, and the widening of trade and commerce, bring to the nations?

But argument will not convince either side, because in truth neither side cares a single straw whether the nation gains or loses by the policy it supports. The politician proclaims faith in protection, though knowing perfectly that the protection he provides is simply protection to the manufacturer to sell bad goods at high prices; his opponent proclaims faith in lowered tariff, though knowing he knows nothing about its real value; each cares only what he can make the voters believe, not what may really benefit the country which he pretends to call his.

But our papers write as though the advocates of lowered tariff in the States were men of the mental and moral fibre of our British Brights and Cobdens. America has no such public servants, though she has many thousands of their kind, who unfortunately fail to serve her, fearing the corruption of public life. Hereafter they may be moved to act, when time shall show

But for them, Columbia's days were done.

FAMILY MUSIC.

A PARABLE.

ANY years ago, and in a far-off place—it matters little when and where—a pleasant custom arose in family circles. The young folks were invited and encouraged to read aloud from the pages of the great writers in prose and poetry who live still among us in their works. One would read some noble scene from Shakespeare's plays, another would take a stirring chapter from a volume of history; then a philosophic essay would be read, to be followed perhaps by a touching or a humorous story. And so for hours together the family circle would enjoy the finest works which our language has produced, while all, except the actual reader at the moment, would be engaged in pleasant tasks—drawing, painting, or the like, according to their several tastes.

Sometimes indeed these tasks, little though they interfered with the enjoyment of the reading, would be left for a while; the glow of enthusiasm would light the faces of all hearers as some noble passage was rendered by an appreciative reader, the tear of sensibility would course down the cheeks of the younger as some moving tale was told, or it may be that the delight of happy laughter at some well-told and well-read story would check for awhile the progress of the hearers' handiwork. In the enthusiasm, the emotion, the sense of humour thus aroused, the hearers showed their appreciation of what the poet or the philosopher, the historian or the narrator, have produced for our benefit. It was an offering of grateful recognition to their memory; and Chaucer and Spenser, Shakespeare and Milton, Addison and Goldsmith, Scott and Thackeray, and a host of others in ancient and in more modern days, came to be regarded in those family gatherings as the chief benefactors of their kind.

It will hardly be believed, but so it happened, that in the course of time this pleasant and most profitable custom changed in character, until at last it brought as much annoyance as before it had produced pleasure. The young folks became more skilful and proficient as readers, but they began to think much more of their own reading than of the inherent beauty and value of what they read. Then they gradually developed a taste for reading passages of considerable difficulty, either because of the complexity of the

sentences in which thoughts had been involved, or because of the profundity of the philosophical matters with which the author (not perhaps expecting that his writings would ever be used for family reading) had dealt. Next this process of evolution extended to the introduction of readings in foreign languages. Some of the readers learned to pronounce these languages very accurately and fluently, so that had there been any native speakers of those tongues present they would have been edified by the correctness of the readings; but unfortunately this was far from being the case with all.

Later still, a very singular and by no means agreeable development occurred. Many authors, including some who were capable of much better things, began to apply their powers to the production of passages which should be very difficult to read. Quaint and perplexing combinations of consonants and vowels, sibilants and gutturals, aspirates and hiatuses, were produced in great abundance. Some of these became quite celebrated for the difficulties of pronunciation which they involved. The great aim of the readers was now to render such passages as these with great rapidity, yet without flaw, and with perfect smoothness of enunciation. It might have occurred to them that the hearers would probably care little for the circumstance (for example) that "Peter Piper" with extreme rapidity "picked a peck of pickled peppers," and would take little interest in the statement that "*Si ces six saucissons-ci sont six sous, ces six saucissons-ci sont trop chers*,"—such, only on a much fuller scale, and in much more elaborate form, were the subjects which had now almost everywhere replaced the moving themes of former readings. If, after several members of a family had exhibited their elocutionary skill with these artificial nothings, some inexperienced visitor began to read "Hail heavenly light, offspring of heaven first born," or "The quality of mercy is not strained, it falleth as the gentle dew from heaven," a stirring scene from history, or an affecting passage from the works of some great narrator, the practised readers of mere puzzledoms of pronunciation plainly showed by their looks or by remarks in scarcely lowered tones that they regarded all such readings as out of date and worthless.

Even this was not quite the last stage of this curious development. The kind of reading which had now come into vogue extended outside the family circle. Reading—as they called it, though it was no longer reading at all—began to be a profession. Men and women devoted all their time and energies to acquire rapidity and precision of utterance, in such sort that nothing which had been written either in their own language or in others, even though devised specially to tax the vocal organs, was beyond their powers. More and more volubly, more and more mechanically (so to speak), and, alas! more and more vociferously, did these wonderful professors of the art still called reading enunciate passages which various authors had composed to show what the organs of speech might with practice be made to accomplish. They gave public exhibitions of their skill in the new art, sometimes making family readers a little ashamed of their inferiority (which, as it to some degree silenced those home torturers, was a gain), but for the most part encouraging their pupils to fresh exertions, and so inflicting enhanced miseries on those pupils' families. As tests, now, of the powers of the professors of reading, it became customary to time them at their work, or to note the loudness of their strident voices! Incredible though it may appear, one would find infinite credit given by press critics to Professor von Bellow because he could be heard four streets from the reading-room; or to Herr Rubouttime (the most admired professors were foreigners) because he had gotten through Marc Antony's oration in two-thirds of the time in which it had ever before been recited. For some of the grand old subjects were still, strange to say, taken up by the professors of the new school, perhaps just to show how much they had advanced beyond the old school, and certainly their readings were calculated to throw an entirely new light on those noble works—a light to which Shakespeare and Milton, Dryden, Pope, Addison, Johnson, Goldsmith, and the rest would rather seriously, perhaps, have objected. Among the professors, indeed, were some who knew how little all this resembled real reading. We have heard of one of them who was so moved by the beauty residing in the works thus unfeelingly dealt with, that having made his fame by perfection of mere vocal mechanism, he would give real readings so moving that von Bellow himself exclaimed at the close of one of them, "List, list!—hark! music i' the air! After him, what right have we word-choppers to let our harsh notes be heard?"

By this time all enjoyment in family reading had passed away, except in a few old-fashioned families, who still followed in the old ways. If family reading had altogether ceased, the loss would have been serious, but the mischief not so distressing. Unfortunately, reading had by no means ceased. It had become a point of honour in almost every family to have at least one skilful reader in the new style, and as it was difficult to determine while the children were as yet young which among them would be loudest and most voluble, all the girls, at least, would be diligently trained (in families where the expense could be spared) by professors of the art of voluble vociferation. For the boys this was not generally found possible (though they should have been regarded as more likely than the girls to achieve success), for, luckily, they had other matters to attend to. The result of this, apart from the discomfort caused by the noise of much practising, was that at gatherings of the young people it came to be regarded as a point of courtesy to invite all the girls in succession to read or to recite after the new methods, pretending great pleasure when each piece was concluded—and indeed, in one sense, the pleasure was not always feigned. As the young ladies nearly always selected pieces just beyond their powers, and satisfied their ambitions rather with the difficulty of the parts attempted than with the perfection of their performance, these displays were not often even interesting as samples of the bad new system of family reading which had come into vogue. It was noteworthy, too, that even when some noble subject of the older type had been selected, and skilfully rendered in the new method, the applause was always for the reader, never for the grand thoughts which the author of long-past days had worthily rendered in verse or prose. Though, indeed, this was hardly to be wondered at, since had he lived to hear them so travestied he would not himself have recognised them for his.

One other remarkable feature of the modern readings remains to be mentioned. Of old it would have been thought monstrous had any of an audience spoken while the impressive words of the men of former days were lovingly rendered by an appreciative reader. Now, nothing was more common than for a whole roomful of non-auditors to join in general conversation while a reading was in progress. Nothing, except, perchance, some vulgar and coarsely-worded patter piece had any chance of securing attention from a company supposed to be collected as lovers of all that is great and grand in poetry, in narrative, in history, and in description. The readers had become so accustomed to this that they took it all in good part. Indeed, some among them had acquired such skill, from long practice in their art, that they could maintain a conversation (in the finger language), or even carry on a flirtation, while engaged in the most difficult recitations.

All this, it may perhaps be urged by some fanciful reader, has nothing to do with family music. No more, I admit, than the readings I have described have to do with literature or learning. But it has at least as much to do with what is now called family music as this has to do with real music—with music such as Bach, Beethoven, Mozart, Gluck, Weber, and Rossini composed, and every real lover of music understands by the word.

My parable scarcely needs interpretation. Unfortunately it runs too near the truth for its meaning to be missed. The story in itself seems absurd; none, one might imagine, could so deal with the great works of the masters of literature, or with poetry and history, the drama or narrative, as our story imagines an unwise race to have done. Yet has not music, which in some aspects is even a sweeter gift to man than literature, been as villanously ill-treated as we have here supposed literature to have been?

Not very many years ago it was the pleasant custom in family circles to invite the younger folks to play such music as was within their power from the pages of the great composers in various musical styles. One player would render some noble passage from an oratorio or a dramatic composition, arranged in such sort for home music that the ideas of the composer might be brought out and the listener's emotions stirred; another would play some grave or touching air, rather suggestive of calm or sadness than of dramatic action; then a lively melody belonging perhaps to some group of national airs would be played; or a song, sweetly and lovingly rendered, would move the auditors to pleasant tears or cheerful smiles, recalling days that had passed, or suggesting thoughts of happy times to come. With what pleasure did those hours pass when music was given by those who loved it, when every passage suggested the feeling on the player's or singer's part, "How grand or how stirring, how sad or how bright this movement is, how great our debt to the master who composed it!"

All this has now been altered. Our young folks have played and practised till they have forgotten all about the composers, and what the composers strove to say and to teach. They play now as if it was to hear *them*, not the music of Beethoven or Mozart, of Haydn, Handel, or Bach, their audience were there. They seem to say all the time, "Observe how brilliantly I—I, the performer—am striking out this passage. There's no occasion to think of the meaning of the passage, or to remember with gratitude the master who composed it. It is the way I manage it that you are to notice."

As a result of this utterly depraved taste these performers (who have no music in them) think much more of the difficulty of music than of its meaning. Unfortunately there is much beautiful music which is of necessity difficult, no matter what may be done to simplify the expression of the ideas running through it. We cannot, for example, in any way bring some of the finest music written for piano by Beethoven and Mozart within the power of execution possessed by players who have not devoted much time and care to practice. Nor is it desirable that the easier parts of a sonata should be rendered while the more difficult parts of what really is one grand whole are omitted. The question of difficulty *must* come in, then, in the selection of family music. In former times this was settled very simply indeed. The musical members of a family would play only what was within their power, what they could render with sole reference to its musical meaning, free from any anxiety as to the difficulties of execution. No doubt it was always recognised, indeed, that, apart from difficulties of execution, there must be selection depending on the real musical power of each performer. A player well able to render the simpler sonatas of Mozart, for example, might be quite unable to render the thoughts running through those compositions while a player of genuine musical power, unable to play a composition of one of the modern masters of complexity, might be justified in regarding the music in such a composition as utterly beneath him. But nowadays the question of difficulty is all in all. A girl who has well-practised, lissome, and powerful fingers, insomuch that she is able to execute readily the most marvellously complex passage—so readily as to knock all the music out of it in the process—listens with ill-concealed contempt to the playing of some piece which "she learned when she was twelve years old"—a piece which, simple though it may seem, she neither can now nor ever could, if she gave all her time to it, render with any approach to the true interpretation of the composer's meaning. Those even who have some musical taste are infected with the false gallop of modern music—which is not true music at all—and direct all their practice to rendering notes and sequences of notes, none whatever to the enunciation of the composer's ideas. If in a few families the old style of music is played, it is played within the home circle only. At any gathering of young folks the system of torture called "having a little music" is steadily pursued, until every note-fingerer has executed his or her proudest achievement, not one musical idea being expressed—it often happens—during the whole evening.

Among our professors of music, and even among some who are regarded as great players, the same faults are to be recognised—nay, with some of them these faults are found in even more marked degree. At a concert ask the performers, "Whom have this audience come to hear?" and each will name (after himself) the other performers. It is to hear Rubinstein and von Bulow the people go to St. James's Hall in London or to Steinway Hall or Chickering Hall in New York; so think von Bulow and Rubinstein, and they think about right, unfortunately. But as surely as I go to the theatre to hear Shakespeare or Molière, not to see Booth or Irving—to be grateful to these only in so far as they render justly the thoughts of the great masters—so assuredly I go to a concert to hear Bach and Beethoven, Mozart and Mendelssohn, and to be grateful to Rubinstein or to von Bulow only as they worthily bring out the melody and the harmony, the fire and the passion, the sadness or the gaiety, of the masters' marvellous music. That the greatest performers often fail in this, the chief part of their task, all lovers of music must sorrowfully admit. One who stood near the first rank (that he thought himself absolutely first goes without saying) unconsciously admitted as much in conversation with myself. "No musician," said Ketten to me, "expects to be *touched* by good pianoforte playing, the object of which is not to move the emotions, but to satisfy the taste."

I picture to myself Mozart or Beethoven at one of those ridiculous little boxes on legs called in their day pianos, whence not one-tenth the volume of sound could ever have come which a modern Steinway or Erard pours forth, moving all hearers—himself included—to sadness or to joy, stirring every emotion in turn at his will, and I wonder what either of those masters would have said of the profane moderns who speak of the piano as made but to satisfy the taste by the exhibition of powerful and delicate manipulative processes. I think Shakespeare was moved by the soft sounds of the still weaker music-boxes of his day when he wrote "The man that hath not music in his soul," and the rest that we know so well. He writes to his love, of the time—

> When thou my music play'st
> Upon that blessed wood whose motion sounds
> With thy sweet fingers, when thou gently sway'st
> The wiry concord that mine ear confounds,

the whole tone of the sonnet telling of emotions stirred by one whose execution was doubtless as weak, compared with that of the modern performer, as was her poor music-chest compared with a modern grand. But if a child (like the little Mozart), playing some simple melody, touches the emotions, while a great performer executing a noble piece pleases only the taste by correct technique, the child is the truer musician, the great player is—only a great player; the very greatness of his skill, and the true grandeur of the composition he accurately but not earnestly renders, attest the narrow limits of his musical capacity. He does well what a machine might be made to do better. Such a man, though thousands rush to hear him—as they would to see a Blondin on the tight-rope—judges rightly the players of his kind when he says, as von Bulow did of Liszt's true music, "After that, what business have we mere wood-choppers at the piano?"

A PRODIGY OF MEMORY.*

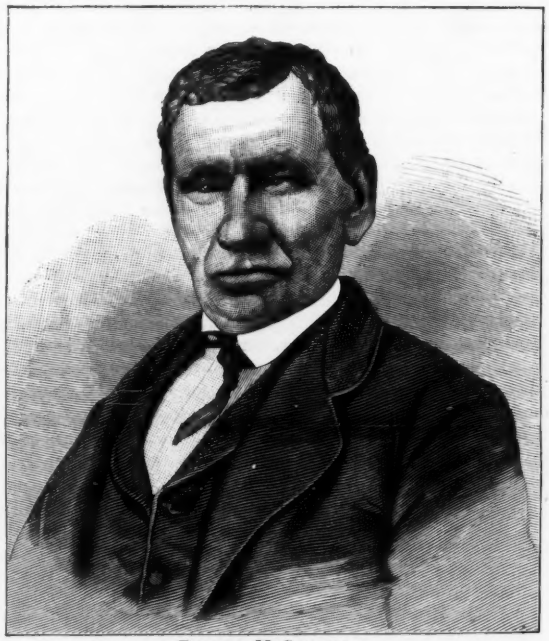
By J. H. Creighton.

DANIEL McCARTNEY was born in Westmoreland County, Pennsylvania, September 10, 1817. His father was of Irish descent, and his mother German. I first met him in Delaware, Ohio, in 1871. Notice of his coming, and what he would do, was given in the papers several days before he arrived. The meeting was in a public hall. The president and several professors, and many students of the Ohio Wesleyan University, and also a few citizens, were present. Mr. O. C. Brown, of Cardington, O., stated what he could do, and introduced him and conducted the examination. Mr. S. Moore, of the First National Bank, was prepared with calendars and other documents to test his claims. Other gentlemen were also prepared in various ways to decide the truth of Mr. Brown's statements.

Mr. McCartney was then fifty-four years old, of medium height, rather heavy set, with rather large, well-formed head; square, large, high forehead; complexion pale. Countenance sober, dignified, benevolent. Eyes defective, not being able to see clearly, and yet not entirely blind. His speech was deliberate and confident, using but few words. His dress was cheap but decent.

The audience were requested to ask any questions they chose. As the examination went on, we soon found that everything that had passed before his mind for forty years was remembered. I can only refer to a few things that occurred in the two hours of most varied questioning. He could tell the day of the week (by having the year and day of the month) back for forty years, and tell it instantly. He could tell the dates of most important events from his boyhood. Could give the state of the weather, forenoon and afternoon, for forty years without mistake. One gentleman asked for the day of the week about fifteen or sixteen years before. McCartney replied *Friday*. "No," said the gentleman, "that is wrong. That was my wedding day, and it was *Thursday*." "Now," said Mr. Brown, "can any gentleman in the hall tell who is right?" "Yes," said Mr. Moore; and in a minute or two from his old calendar he found that McCartney was right. During the evening one or two other questions were raised as to the day of the week, but by the old calendar McCartney was right every time.

He was a complete concordance of the New Testament and most of the Old Testament. Professor Hoyt (Hebrew professor) read a large number of passages from the Scriptures, till the audience were entirely satisfied that he knew where every passage was. He could tell what he was doing every day from his boyhood. President Merick, having prepared himself on several dates, asked him what he was doing on a certain day, naming the time, several years before. "Looking at the eclipse," said he. His multiplication table went up into millions. He could give the cube root of numbers up to millions almost instantly. One of the numbers given was ten figures deep, another was eleven figures deep. He could raise any number under 40 to the sixth power instantly. He could raise any number under 100 to the sixth power in ten or fifteen minutes. He was given the number 89, which is a prime number and more difficult; but he raised it in a few minutes (496,981,290,961). He could instantly give the minutes and seconds of periods of time from the Mosaic creation, and could give the feet or inches of sidereal distances. Professor H. M. Perkins (professor of astronomy) asked him a question. McCartney said he had never been given such a question, but he would see. What was very remarkable was, he never asked the professor to state it again, although it was most complicated. In about three minutes he said it came out with a fraction, and the fraction was one-eighth. In a few minutes more he told off the long line of figures. A gentleman wrote five or six columns of figures, seven or eight deep, on the blackboard and read them to him. He could immediately repeat them backward or forward; and being asked the next day if he still remembered them, he told them off again without a mistake.



Daniel McCartney.

At the close of the examination several questions of another nature were asked. Some of them were of a nature not needing any test, for we were perfectly satisfied of the accuracy of all his statements. His powers of memory were noticed when five or six years old, and he could remember a great number of little events from that early age. His full power of memory was attained at the age of about sixteen. He knew two hundred hymns, and could sing one hundred and fifty tunes. He could remember what he ate for breakfast,

* From the *Scientific American*.

dinner, and supper for more than forty years. He learnt nothing by reading, but all by hearing. His sight was so defective, especially in early life, that he could not read, except very coarse print, and that very slowly, and with great difficulty. He was always poor, and his relatives, with whom he lived, were poor. The question has often been raised why a man with such prodigious memory did not prosper in some business. Doubtless the principal cause of this was his deficient eyesight. Several attempts were made to bring him before the public, but with very little success. At one time, in 1871, he appeared in the Opera House, Columbus, Ohio, when members of the legislature, teachers, and professional men were present. At that meeting he answered questions similar to those above stated, and gave entire satisfaction.

He retained his memory to the time of his death. He was in possession of most all these vast powers for about sixty years. When answering questions about certain things, President Merick asked him how he did it, or if he had any particular mental process or rule. He said, "I just know it." The answers to some questions, however, showed that it was not all mere memory, for they required some reasoning powers. This was particularly so in the question given by Professor Perkins.

It has been considered that the invention of logarithms by Napier stands among the greatest works of intellectual power in the world, and will be a monument to his name and fame for ever. But McCartney would not need these tables. He was himself a living table of logarithms. These deductions, that cost Napier long and tedious hours of figuring, McCartney could solve at once without pencil or paper, and without mistake.

Daniel McCartney was supported for the last few years of his life at the county farm, near Muscatine, Iowa, and died in that place, November 15, 1887, aged a little over seventy years.

THE LOWELL INSTITUTE, BOSTON.

BOSTON has been distinguished as a lecture-loving community from the beginning of the century. We hear of courses of lectures delivered in 1813 by Professors Peck and Bigelow on botany, and by Dr. Gorham on chemistry. Already, in 1839, the number of lecture-courses delivered during the season in Boston had reached the scale ridiculed (in somewhat Philistine fashion) by Dickens a few years later in "Martin Chuzzlewit." It was calculated that these lectures (not including courses of fewer than eight) were attended by nearly fourteen thousand persons; and it was asserted by Professor Everett at the time that the number of courses had been steadily increasing during twenty years.

But it was felt even then that the community might withdraw their attention from lectures and lecture-courses, when the attraction of novelty passed away and the zeal of a first enterprise was exhausted. Caprices of fashion, changes of popular taste, if less to be looked for in Boston than anywhere else in the States, then or now, must be counted upon even there; and still more were to be dreaded what then perchance few looked for—the effects of depressed trade, increasing inequality in the distribution of wealth, and the consequent intensity of the struggle of life. Men can take small interest in science, art, and literature when in anxiety about their own and their families' daily bread. "And even," as the elder Everett said in 1839, when announcing Mr. Lowell's bequest, "if there were no just ground to fear an entire discontinuance of public lectures, it is obvious that the present system contains no principle for such a steady improvement in the character of the instruction they furnish, as is necessary to make them a very efficient instrument for raising the literary and scientific character of the community."

It was at this time, or, more precisely, in 1836, that John Lowell, jun., a grandson of Judge Lowell, who had played a noteworthy part in the struggle of the British colonists in America for independence, bequeathed the sum of 50,000*l.* to found an institution for the development of this valuable method of intellectual and moral culture. He was travelling in Egypt when the illness which proved fatal a few months later seized him; and it was at Luxor, in a room above the remains of an ancient palace of the Pharaohs, that he penned his suggestions in regard to the future institute. "As the prosperity of my native land, New England," he wrote (and I may note in passing that to most Americans, but especially to New Englanders, their State, or section among the States, is as their country), "which is sterile and unproductive, must depend hereafter, as it has depended heretofore, first on the moral qualities, and secondly on the intelligence and information of its inhabitants, I wish courses of lectures to be established on physics and chemistry, with their application to the arts; and also on botany, zoology, geology, and mineralogy, connected with their particular utility to man. After the establishment of these courses, should disposable funds remain, or in process of time be accumulated, the trustee may appoint courses of lectures to be delivered on the literature and eloquence of our language, and even on those of foreign nations, if he sees fit. He may also from time to time establish lectures on any subject that in his opinion the wants and taste of the age may demand."

Such were the words penned by this true lover of his country and of humanity in the midst of the ruins of monarchies whose resources were lavished on war and spoliation, luxury, and superstition. Almost within sight of the pyramids, those monuments of brutal yet superstitious selfishness, constructed with the aid of science diverted from the true use of science—the welfare and the culture of the many—to subserve the purposes of the despotic and luxurious few, Lowell planned his work for advancing the people of his native land. Where (*pace* Professor Piazzi Smyth) a Cheops and a Chephren had built temples for priests and astrologers, whose watch upon their planet gods was to advance those monarchs' plans and power, Lowell planned for the benefit of his people at home. Where Cheops and Chephren bequeathed their money to complete those temple-observatories into tombs in which their own bodies might most deservedly be hidden and forgotten, Lowell bequeathed his wealth to an institution which should cause his name to be held in loving remembrance, enshrined for ever in the hearts of his fellow-countrymen.

The work done by the Lowell Institute has been worthy of the far-sighted purpose of its founder. It has remained the first in standing, as it was the first in point of time, of all the institutions of the kind, not only in America, but in the world. Judiciously controlled by its trustee (always to be a lineal descendant of the Lowell family, and one of that name) the funds of the Institute have more than doubled. Without interruption, for more than forty years, the curator, Dr. Cotting, a well-known physician of Boston, able, zealous, and genial, has arranged lecture-courses of twelve each, following one another during six months of the year, by men not only able in their several subjects, but zealous like himself to widen the domain over which knowledge extends its strengthening and purifying influence.

Admission to the lectures has been absolutely free, though

tickets have never been obtainable without the sacrifice of some little time and energy—because of the popularity of the institute and the struggle necessary to secure tickets before all are taken. This evidence of appreciation is, however, all that the curator requires, and even the most popular lecturers can obtain (as, indeed, they need desire) no more, the sale of tickets being forbidden, and I believe unknown. Under the auspices of the Lowell Institute, Lyell, Agassiz, Tyndall, Carpenter, Geikie, Brown-Séquard, Bayard Taylor, and (quite recently) Wallace have lectured to audiences, such as can be matched in few cities and are surpassed nowhere.*

An indirect but most important effect of the founding of the Lowell Institute has been the improvement in lectures, especially on scientific subjects, in New England and in the neighbouring States. With such remuneration as the Lowell Institute gives for carefully prepared teachings, lecturers in America have found it in their power to give such time and care to their work as is essential for the production of lectures worth listening to. Of course no conscientious lecturer will in any case come before an audience with teachings which are not the product of hard work and laborious thought, though they may seem simple. Indeed, the simplicity of a good popular lecture on an abstruse subject is generally proportional to the amount of care given to its preparation.

But, unless when a man of means lectures for the love of lecturing (which, as distinguished from zeal to widen knowlege, is scarcely an imaginable quality), it can hardly be expected that the fittest to teach should be ready, even if he were able, to devote a large portion of his time and thought to such work unless he obtained some such consideration for his labours as was essential for maintenance. Where no provision has existed to meet this requirement, the work of spreading knowledge, and with it culture, by means of lectures, is either done ill if it is done at all, or it is done at an undesirable sacrifice of time and money—either by the lecturer or by the society for which he lectures, or by both.

Even when none of these consequences follow, the lecturer has at least had to incur risks which make his task partake too much of the nature of some anxious trade. The student of science who has found no other way to spread abroad those teachings of science which seem to him most impressive and purifying, has to admit in his self-communings that he has—

> Gor'd his own thoughts, sold cheap what is most dear.

He has to chide with Fortune—

> That did not better for his life provide,
> Than public means which public manners breed.

But an institution like that founded by Mr. Lowell helps (at any rate) to make lecturing by fit men possible, in removing a chief difficulty in the way of this particular method of spreading knowledge. Thus, in America, men of science, as well as men distinguished in literature and art, have prepared lectures for delivery under the auspices of the Lowell Institute which they have been able to deliver afterwards, without fresh labour in preparation, though for less adequate remuneration, in the principal towns of New England, Pennsylvania, New York (State), and even in the West and South. Nay, many English lecturers have been similarly helped in their work. Thus the benefit of Mr. Lowell's bequest has extended far beyond the sphere for which it was originally intended.

Nor must we overlook its influence in encouraging some to enter on scientific, literary and artistic work professionally, with the special object of teaching the community rather than college classes. It is desirable that public lecturers should be men thus prepared by special study, not college professors or officials employed in more or less scientific pursuits. If there were no other reason, there would be good reason in this—that the daily work of such officials and professors tends very little to fit them for the lecture platform, while to fulfil the lecturer's duties they must in great degree neglect the duties of their salaried posts. Either audiences are defrauded by insufficiently prepared lectures, or the institutions (private or public) are wronged in which the lecturer holds office.

I may remark in passing that not only the spread of knowledge by lecturing, but the popularisation of knowledge generally, is affected by the difficulties which such bequests as Mr. Lowell's have been intended to remove. This most important part of the higher education of the community is an arduous and even hazardous occupation, insomuch that few of those who are best fitted for the work can engage in it. Very careful and earnest labour is required to spread knowledge effectually, and very limited rewards must be expected for really sound work. Hence, even those who are able to give good instruction are tempted to provide showy but shallow teachings, while this special field of labour has become crowded with those who should be rather students than teachers.

Here also comes in the objection touched on in regard to lecturing. Persons holding well-paid offices undertake the work of teaching science in "language understanded of the people," though quite unequal to the task, or only able to fit themselves for it by neglecting their duties to their employers, whether these be college trustees or the tax-paying public.—R. A. Proctor, in the *Fortnightly Review*.

* I speak with knowledge, not only of this particular audience, but of lecture audiences generally. Twice have I delivered courses of twelve lectures for the Lowell Institute, and throughout I have been able with confidence and satisfaction to deal, when occasion required, with the drier details of my subjects, assured that the audiences would follow me to the last. I know scarcely a lecture-field in the world where I would care to make such an attempt—certainly there is none where I have ever attempted it except in the special class-work of the London Institution. There is no better proof that an audience is in earnest in the study of a subject than this, that they will return again and again to its investigation till the whole of it has been dealt with, and there can be no better proof that a lecture-field has been well cultivated than the existence of this steady earnestness of attention.

TWO BOOKS OF TRAVEL.*

"TIMEO Danaos et dona ferentes," and we confess to taking up a book by the author of "Natural Law in the Spiritual World," and of certain flabby expositions of a filleted Christianity in ducal drawing-rooms, with some misgivings. But we gladly hasten to say that they are groundless. Professor Drummond comes before us in this bright and crisply-written record of his travels in Central Africa as an original contributor to an interesting group of facts which strongly support the theory of natural selection. His book is a model for future narrators of travel to copy. It is entirely free from the padding of peddling detail which swells most books of the kind to unwieldy size and buries really valuable matter under

* *Tropical Africa.* By Professor Henry Drummond. (Hodder & Stoughton.)

Explorations and Adventures in New Guinea. By Captain John Strachan. (Sampson Low & Co.)

tedious verbiage. And beyond shooting ibises to feed the native rowers, who, like all Africans, will do anything for flesh in whatever form, the crack of the rifle is not heard throughout the book. The spirit of Gilbert White, not of Allan Quatermain, pervades it, and Mr. Rider Haggard may search in vain for fresh adventures of the gory type to stock his soon-exhausted supply of butchery fiction. In a brief and humorous preface Professor Drummond, playing the modest *rôle* of a minor traveller, offers as composition on the tax of three or four volumes and a map which literature usually lays on travel, three or four maps and a small volume, and plunging at once into his subject, sets before us in a few vivid sentences the more striking features of the Dark Continent. There are, he reminds us, three Africas for our greed or our pity or our exploits; North Africa, where men go for health; South Africa, where they go for gold or diamonds; and Central Africa, where they go for adventure. Quoting his eloquent words—:

> It is a wonderful thing to start from the civilisation of Europe, pass up these mighty rivers, and work your way into that unknown land—work your way alone and on foot, mile after mile, month after month, among strange birds and beasts and plants and insects, meeting tribes which have no name, speaking tongues which no man can interpret, till you have reached its secret heart and stood where white man has never trod before. It is a wonderful thing to look at this weird world of human beings—half animal, half children, wholly savage, and wholly heathen—and to turn and come back to civilisation before the impressions have had time to fade and while the myriad problems of so strange a spectacle are still seething in the mind. It is an education to see this sight—an education in the meaning and history of man. To have been here is to have lived before Menes. It is to have watched the dawn of evolution. It is to have the great moral and social problems of life, of anthropology, of ethnology, and even of theology, brought home to the imagination in the most new and startling light.

Avoiding the skeleton-strewn Zanzibar route to the interior, ten days' slow steaming brought our author to the mouth of the Zambesi, up which river and the Shirè he voyaged, ultimately reaching the plateau that lies between Lakes Nyassa and Tanganyika. In his chapter on the "Heart Disease of Africa," Professor Drummond clearly shows the intimate connection between the traffic in human flesh and ivory, and hails the rapid extermination of the elephant as marking "one stage at least in the closing up of the slave-trade." The Arab dealers "hold the whole continent under one reign of terror . . . for one object—ivory and slaves, for these two are one. The slaves are needed to buy ivory with; then more slaves have to be stolen to carry it. So living man himself has become the commercial currency of Africa. He is locomotive, he is easily acquired, he is immediately negotiable."

In an elaborate and delightful chapter on the termites or white ants, Professor Drummond shows that they perform similar important functions in the economy of nature in Africa to those which Darwin has shown are performed by earthworms in Europe. The action of worms in tropical countries in mixing and transforming soils is very limited, since they can work only during the few weeks of the wet season, whereas the white ants work all the year round. They do not, like the earthworms, swallow and pass the soil through their bodies, but, to protect themselves from their enemies, heap it up round the trees which they devour, collecting not merely the surface soil, but tunneling it from the interior so that the exhausted lower layers recruit their strength among the invigorating elements. In what divers ways the termites work, and what large results ensue from their labours, is fully and clearly explained, with illustrative woodcuts, in the sixth chapter. Not less remarkable are the facts about mimetic insects, which are given in the seventh chapter, and which are prefaced by an excellent summary of the theory of protective resemblances with which the name of H. W. Bates, the "Naturalist on the Amazons," is chiefly associated. All the world over "there are to be seen creatures, not singly, but in tens of thousands, whose very appearance, down to the minutest spot and wrinkle, is an affront to truth, whose every attitude is a *posé* for a purpose. Before these masterpieces of deception the most ingenious of human impositions are vulgar and transparent."

Professor Drummond was struck with the close resemblance of the adult crocodiles to the rotting stumps amidst which they were lying, and of alligators to floating logs; but it is in the minuter forms of life that the perfection of mimicry is reached. Amongst the most striking example which he found on the Nyassa-Tanganyika plateau was a member of the Phasmidæ family, which mimicked a wisp of hay. "When you catch him, his limbs are twisted about at every angle, as if the whole were made of one long stalk of the most delicate grass, hinged in a dozen places, and then gently crushed up into a dishevelled heap. . . . These grass-stalk insects live exclusively among the long grass which occurs in patches all over the forests. During three-fourths of the year it is dried by the sun into a straw-yellow colour, and all the insects are painted to match." But we forbear quoting further from a somewhat lengthy description of the astounding adaptation of these Phasmidæ and other insects to their surroundings, and must refer the reader to the book itself for an account of insects which have actually become so modified as to resemble a bird-dropping, correspondent to which there is, however, an English beetle, the larval form of which also resembles excrement. Professor Drummond closes his interesting book by urging on our Government the annexation of Nyassa-land, where thriving settlements, churches, and schools are already planted as pioneers of that humanising work which it is our duty to foster and protect.

We are not sure that we should entrust that work to Captain John Strachan, despite the goody-goody talk which is sandwiched between his narrative of exploration and adventure. Not that we question the good mariner's sincerity, which is more apparent than his syntax, only that we think his is "zeal not according to knowledge." How far he has made sound additions to our scanty information about the interior of New Guinea, and especially as to the connections of the great waterways up which he sailed, has yet to be proved, but he has added little to what is known already about the mop-headed cannibals who are slowly coming under British and German influence. His book is occupied with the narrative of three voyages to the island in 1884, 1885, and 1886 respectively, and the author shows himself a man of ready resource and skill, equal to emergencies, and proof against hardships. We should have liked his book much better, and its value would have been increased, had he told us more about the peoples of New Guinea and less about himself, omitting trifling entries from his notes which, like most strayed memoranda, "are of no value to any one except the owner." He "annexed" a Papuan boy (who, however, appears to have been a friendless orphan) and an island, which he has named after himself. We hope that both acts are legal.

The "Rover" Safety still maintains its leading position amongst rear-driving bicycles. On August 15 last, at Bordeaux, S. G. Whittaker, of Chicago, beat all French records, his mount being a light "Rover" roadster manufactured by Starley & Sutton, the full distance ridden being 21 miles 126 yards within one hour. He also succeeded on the same day in beating the five miles' record, doing this distance in 13 minutes 33⅖ seconds. This is the quickest five miles ever accomplished on any kind of cycle.

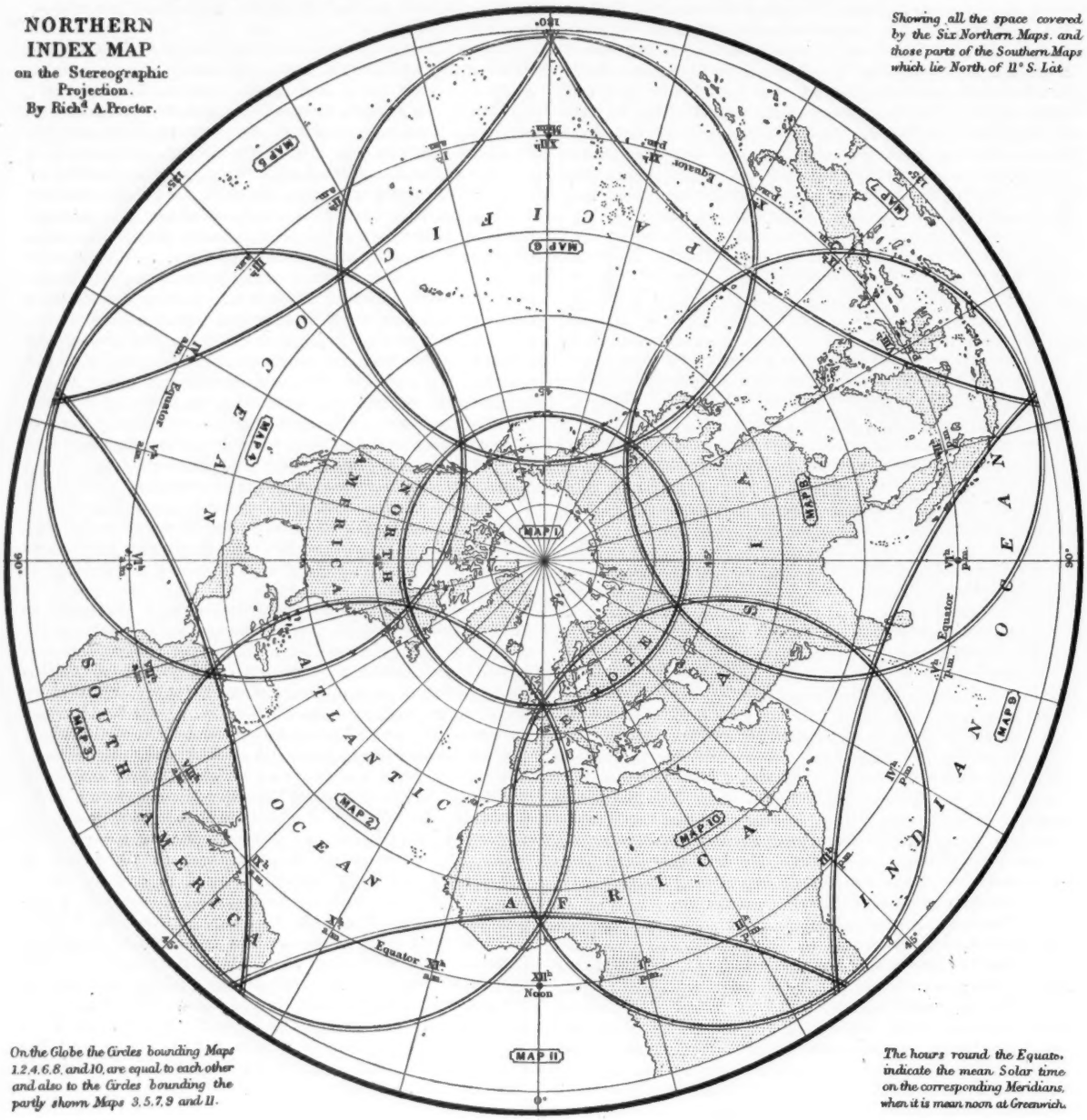
XUM

INDEX-MAPS TO THE ONE-SCALE ATLAS.

I HAVE thought it desirable to have the two index-maps for my One-Scale Atlas, now presently to be published (coloured and with an introduction) in a collected form, re-drawn by Mr. Weller, as my own drawings, reproduced by photolithography in KNOWLEDGE some time back, appear rough beside his admirable engraving. They are now given in order that readers of KNOWLEDGE may have in these pages the complete series of maps as they will finally appear, except in regard to colouring.

NORTHERN INDEX MAP
on the Stereographic Projection.
By Rich[d] A. Proctor.

Showing all the space covered by the Six Northern Maps, and those parts of the Southern Maps which lie North of 11° S. Lat.



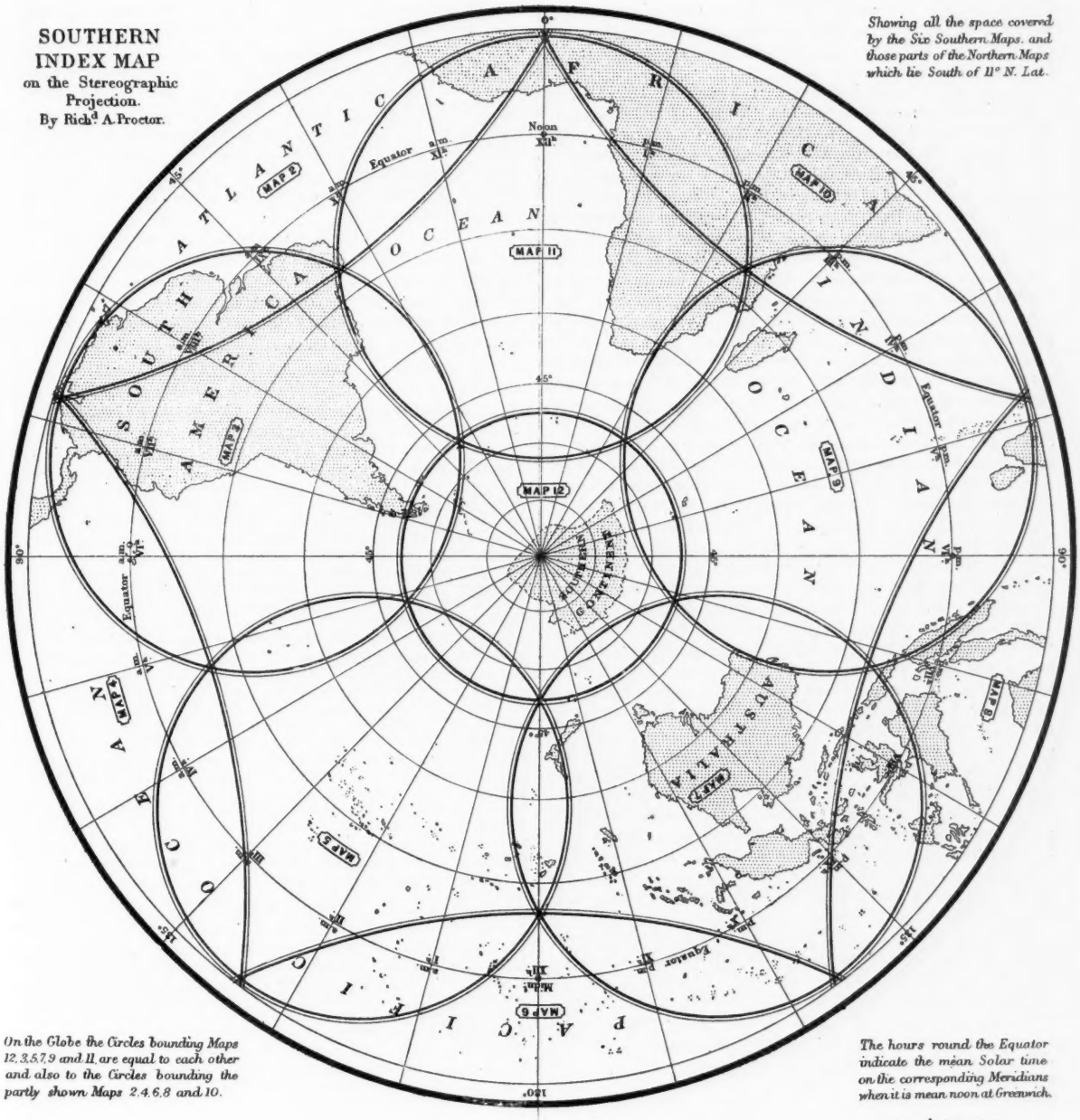
On the Globe the Circles bounding Maps 1, 2, 4, 6, 8, and 10, are equal to each other and also to the Circles bounding the partly shown Maps 3, 5, 7, 9 and 11.

The hours round the Equator indicate the mean Solar time on the corresponding Meridians, when it is mean noon at Greenwich.

London, Longmans & Co. *Edw. Weller, Del.*

SOUTHERN INDEX MAP
on the Stereographic Projection.
By Rich.d A. Proctor.

Showing all the space covered by the Six Southern Maps, and those parts of the Northern Maps which lie South of 11° N. Lat.



On the Globe the Circles bounding Maps 12, 3, 5, 7, 9 and 11 are equal to each other and also to the Circles bounding the partly shown Maps 2, 4, 6, 8 and 10.

The hours round the Equator indicate the mean Solar time on the corresponding Meridians when it is mean noon at Greenwich.

London, Longmans & Co

Edw.d Weller. Del.

SHERIDAN AT GRAVELOTTE.

THE following letter was written by the late General Sheridan, of the Federal army. The confidence with which one of the leaders of the worst-planned series of campaigns recorded in history comments on an army defeated by one of the best-planned attacks will amuse, if it does not edify, English readers. It is not likely French readers will be much concerned :—

Rheims, France : September 13, 1870.

My dear General Grant,—The capture of the Emperor Napoleon and McMahon's army at Sedan on September 1 has thrown France into a chaos which even embarrasses the Prussian authorities. It seems to a quiet observer as though Prussia had done too much. Whom to negotiate with? Whom to hold responsible in the final settlement? are becoming grave questions, and one cannot see what will be the result. I was present at the battles of Beaumont, Gravelotte, and Sedan, and have had my imagination clipped, in seeing these battles, of many of the errors it had run into in its conceptions of what might be expected of the trained troops of Europe.

There was about the same percentage of sneaks or runaways, and the general conditions of the battles were about the same as our own. One thing was especially noticeable —the scattered condition of the men in going into battle, and their scattered condition while engaged. At Gravelotte, Beaumont, and Sedan the men engaged on both sides were so scattered that it looked like thousands of men engaged in a deadly skirmish without any regard to lines or formation. These battles were of this style of fighting, commencing at long range, and might be called progressive fighting, closing at night by the French always giving up their position, or being driven from it in this way by the Prussians. The latter had their own strategy up to the Moselle, and it was good and successful. After that river was reached, the French made the strategy for the Prussians, and it was more successful than their own. The Prussian soldiers are very good, brave fellows, all young, scarcely a man over twenty-seven in the first levies. They had gone into each battle with the determination to win. It is especially noticeable also that the Prussians have attacked the French wherever they have found them, let the numbers be great or small, and so far as I have been able to see, though the grand tactics of bringing on the engagements have been good, yet the battles have been won by the good, square fighting of the men and junior officers. It is true the Prussians have been two to one except in one of the battles before Metz, that of August 16, still the French have had the advantage of very strong positions.

Generally speaking, the French soldiers have not fought well. It may be because the poor fellows had been discouraged by the trap into which their commander had led them, but I must confess to having seen some of the "tallest" running at Sedan I have ever witnessed, especially on the left of the French position : all attempts to make the men stand seemed to be unavailing. So disgraceful was this that it caused the French cavalry to make three or four gallant but foolish charges, as if it were to show that there was at least some manhood left in a mounted French soldier.

I am disgusted : all my boyhood's fancies of the soldiers of the Great Napoleon have been dissipated, or else the soldiers of the "Little Corporal" have lost their *élan* in the pampered parade soldiers of the "Man of Destiny."

The Prussians will settle, I think, by making the line of the Moselle the German line, taking in Metz and Strasburg, and the expenses of the war.

I have been most kindly received by the King and Count Bismarck and all the officers at the headquarters of the Prussian army; have seen much of great interest, and especially have been able to observe the difference between European battles and those of our own country. I have not found the difference very great, but that difference is to the credit of our own country. There is nothing to be learned here professionally, and it is a satisfaction to learn that such is the case. There is much, however, which Europeans could learn from us—the use of rifle-pits—the use of cavalry, which they do not use well; for instance, there is a line of communication from here to Germany exposed to the whole of the South of France, with scarcely a soldier on the whole line, and it has never been touched. There are a hundred things in which they are behind us. The staff departments are poorly organised; the quartermaster's department very wretched, &c.—Very respectfully, your obedient servant,

P. H. Sheridan, Lieutenant-General.

How many hours, one may ask, would a German, French, or English army of 100,000 men have taken in accomplishing what the North accomplished in four years with ten times that number? The South was never beaten : it wore itself out beating the North.

A NEW AND USEFUL THERMOMETER FOR HORTICULTURISTS.

THE value of the thermometer to the intelligent gardener has long been recognised and appreciated, especially for the rearing of exotic and delicate plants, or the development of fine flavours in fruit, which, although acclimatised and productive enough in the open air of our very variable climate, are yet prone to degenerate unless the conditions of temperature and moisture are very carefully regulated and modified from time to time. Every grower of hot-house grapes will be ready to admit that his charges need to be most sedulously tended in this respect; the temperature must be regulated to a nicety, and thus maintained during certain periods, *i.e.* when the inflorescence commences to show itself, when the flowers expand, when the fruit are young, and when they begin to ripen. These remarks are strictly true, though to a less degree, even with the hardiest of outdoor plants, and the horticulturists who devote due attention to a mastery of this subject must assuredly be repaid by reaping an ample reward.

Plants, especially hot-house plants, are most liable to suffer through neglect during the night time; and since the gardener can scarcely be expected to remain constantly on the alert, he should learn how to regulate his stoves or hot-water apparatus, so that at no period can the temperature fall below a certain ascertained degree. For this purpose it is necessary to use a registering thermometer to record the lowest temperature of the hot-house during any given period, and the instrument hitherto used has been an ordinary minimum thermometer, which, as most of the readers of Knowledge are aware, consists of a stem and bulb containing alcohol, whilst within the stem is included a small movable porcelain index. The instrument is to be placed horizontally *in situ*, and, as the temperature falls, the surface tension of the spirit draws the index back with it. When the temperature rises, the spirit flows readily past the index, leaving the latter at the lowest point attained. Now most of the minimum thermometers are provided in this country with a Fahrenheit's scale, the freezing-point of which is 32° above zero, so that should the index register 20°, it would necessarily mean only 12° below freezing-point. In order to make this clear to practical gardeners, and prevent them from falling into any error, Messrs. Dollond & Co., of 1 St. Paul's Churchyard, London, have added a small scale on the opposite side to the one which indicates Fahrenheit's ordinary divisions, and which is marked 0° opposite 32°, and in regular ascending number towards the bulb. This side scale thus indicates clearly the number of degrees below freezing-point, for suppose the ordinary index registers 30°, this supplementary one would at once show 2° below the freezing-point, and so on. By this means much confusion will be saved, and the practical gardener will gain confidence in his instrument instead of discarding its use altogether, as is so often the case, on account of his having to make what to him would be a troublesome calculation every time he takes a reading.

SCIENCE AND IMMORTALITY.

AMERICAN SCIENCE NOTES ON THE QUESTION.

AN American paper recently presented a series of articles, several of them by eminent scientific men (American), on "Science and Immortality." The following is a summary of their views:—

(1) Professor James D. Dana is of the opinion that there is nothing in science against immortality.—(*Neutral.*)

(2) Professor Asa Gray thinks that the interpretation of nature is not beyond the highest scientific consideration, that the theistic hypothesis is the best explanation of the facts, and that "immortality is a probable, but not an unavoidable inference from theism."—(*Indefinite, but slightly favourable for the positive view.*)

(3) Professor Joseph Leidy regards no question as out of the pale of science, and he thinks the facts of science make it difficult to believe in the persistence of personal consciousness after bodily dissolution.—(*Strongly negative.*)

(4) Professor Simon Newcomb is "inclined to regard the question as lying wholly without the pale of science, properly so called," does not think modern investigation has brought to light any new facts bearing upon it, and that if consciousness has been a gradual development, as is implied in the theory of the continuity of organic life, it "seems difficult to assign any link in the series at which we can suppose so great a break to have occurred as is implied in the passage from mortality to immortality."—(*Negative.*)

(5) Professor J. P. Lesley says: "Science cannot possibly either teach or deny immortality."—(*Neutral.*)

(6) Professor Lester F. Ward says that, "so far as science can speak on the subject, the consciousness persists as long as the organised brain, and no longer."—(*Decidedly negative.*)

(7) "The immortality of science," Professor Ward says, "is the immortality of matter and its motions in the production of phenomena," and that with them consciousness, the product of the eternal activities of the universe, should not be confounded.—(*Indefinite.*)

(8) Professor E. S. Morse writes: "I have never yet seen anything in the discoveries of science which would in the slightest degree support or strengthen a belief in immortality."—(*Strongly negative.*)

(9) Professor Cope seems to regard immortality as possible in spite of apparent evidence against it, but doubts the persistence of our personality.—(*Practically negative.*)

(10) Dr. Dawson, of McGill University, refers to the instinct of immortality in savage races as a "God-given feature of the spiritual nature yearning after a lost earthly immortal, and clinging to the hope of a better being in a future life."—(*Intended to be favourable, but practically negative*)—savage instincts on matters of philosophy being invariably erroneous, or based on erroneous grounds.

(11) Dr. T. Sterry Hunt thinks that the "facts of modern science are rather contrary than favourable to the doctrines of a future life." Nevertheless, he believes in a conditional immortality, "the gift of God," but lacks time to explain what he means.—(*Incertior sum multo quam dudum.*)

(12) Dr. B. A. Gould thinks there is nothing in science that should lead to disbelief in immortality.—(*Neutral.*)

(13) Dr. Alfred R. Wallace says: "Outside of modern spiritualism I know of nothing in recognised science to support the belief in immortality, and though *I* consider spiritualism to be as truly an established experimental science as any other, it is not recognised as such."—(*Practically negative.*)

(14) Dr. Asaph Hall thinks science gives no positive answer to questions concerning immortality, but that modern discoveries tend to strengthen the belief.—(*Doubtful.*)

(15) Dr. Elliott Coues says: "There is much in the discoveries of psychic science not only to support or strengthen the belief in immortality, but to convert that belief into knowledge.—(*A strongly positive decision* — but from a spiritualist.)

(16) Herbert Spencer, according to Rev. M. J. Savage's recollections of a conversation with him, does not think evolution touches the problem of personal immortality either way, and he sees no satisfactory proof of the truth of the latter doctrine.—(*Negative.*)

(17) President Barnard, of Columbia College, N.Y., says: "After mature reflection, it seems to me that science has nothing whatever to say to the question. The only basis of our faith in immortality must be found in Revelation."—(*Practically negative.*)

(18) A quotation from Huxley's article in the *Fortnightly Review*, December 1886, raised the question whether the state of consciousness associated threescore years and ten with the movements of countless millions of successively different material molecules, can be continued with some substance which has not the properties of "matter and force." Huxley's reply is, "As Kant said on a like occasion, if anybody can answer that question he is just the man I want to see."—(*Definitely negative.*)

In commenting on this and other notable expressions of opinion which it publishes, the *Christian Register* remarks: "If unanimity can be found anywhere in these articles, it is most nearly attained in the general concession that science cannot show that immortality is impossible;" but, be it added, science can show, and has shown, that every supposed point of evidence on which the theory of immortality had been made to them—the breath or "spirit," the shadow or "shade," dreams of the dead, visions, and the rest, are without exception fallacious.

DUEL BETWEEN A TIGER AND A COBRA.

SNAKE hunting in India is a venturesome business. It was not much of a feat to secure the serpent we wanted, and in the course of a fortnight we were ready to pull up stakes. Then occurred an incident which almost made an old man of me in an hour.

The hut I occupied had been used as a storehouse. On each side of the single doorway was a stout fence made of poles running out about 25 feet, thus making a lane or passage about 3 feet wide. When the house was filled with grain a sentinel watched at the mouth of this lane. Only one person could go or come at a time, and each was thus under supervision. They had slung a hammock for me, so that I faced the door and looked down this lane when lying on my right side. Each night a fire was built just at the mouth of the lane, and there were so many other fires scattered about that we felt safe from tigers or serpents.

On this night I turned in at about ten o'clock. Half an hour later it began to rain heavily, and in a few minutes all the fires were out. The rain continued until after midnight, and then it cleared up and the moon rose. I had slept for an hour and awoke just as the light of the moon came over the jungle. It shone full up the lane, and the first thing my eyes rested upon was a large cobra making its way toward me. We had seen none of them in our two weeks' stay, but I knew the species the instant I caught his

motion. My two guns were in the hut. To spring out of the hammock and seize one of them and fire at the serpent was the work of ten seconds. That was my programme, but as I made the first movement I found myself fast. I had not removed my trousers, and the buckle had worked itself down among the fibres and become fast. I had only time for the one effort. To get clear I must dump myself out on my knees, and the serpent was too near for that. The cobra might flee in affright, but he was more likely to spring upon me. And suppose there was a pair of them, and that the other had already entered the hut!

In ten seconds after this thought came to me I was in a cold sweat, and so weak that I could not have stood on my feet. The slight movement I had made had alarmed the cobra, and he coiled himself and waited full two minutes before coming on again. I ought to move and also raise my voice, but for the life of me I could neither raise a finger nor utter a sound. You may smile at the idea of a man being so unnerved, but I was completely helpless. I had faced every sort of wild animal, and I had taken some risks to make men's hearts stand still, but this was a cobra—the most dreaded of all the serpent race in India. Let his fangs but touch my flesh and I was a dead man. I had seen his victims by the dozen, and I knew something of the agonies they suffered before death came as a merciful relief.

The serpent might have been ten minutes crawling the fifteen feet which brought him into the hut. As soon as he was over the threshold he was in the darkness, and I could no longer see him. I heard him crawling about over the dried grass on the floor, however, and knew that it was only a question of minutes when he would seek a closer acquaintance with me. He might not strike me at once. The cobra never strikes unless cornered. He never strikes a sleeper. My hammock was swung about three feet from the ground. After a few minutes I heard the snake crawling towards me, and I prepared for the worst. When I turned in it was very close and oppressive. I had, therefore, thrown the blankets out of the hammock. The cold rain had chilled the snake, and he was looking for warmth. The blankets were on the ground, and this fact prevented him from coming into the hammock. I could not see him, but I could hear and scent him as he twisted about and finally curled down. When he had become quiet I felt that I had a chance for my life. I would wait until he was asleep, and then make a sudden spring and a rush. If I waited until daylight aroused the natives, the cobra would certainly bite me.

I was cooler now, and I waited from twenty to twenty-five minutes before moving. I was just planning to dump myself out of the hammock when the moonlight revealed a new and unexpected danger. Standing at the mouth of the lane and looking straight in upon me was a tiger! That he had entered the village in search of prey I knew by his demeanour. That he was an old tiger and a man-eater one could see by his lordly air. Instead of coming in from the jungle he had come across the open and cultivated land, and my hut was first in his path. I did not believe he would enter the hut. The lane would look like a trap to him, and he would fight shy. After looking at me for perhaps two minutes, the tiger moved out of sight, and presently I heard him stealing around the hut to look for an opening. There was no other, and he returned and surveyed me again. While my eyes were wide open, I did not move a finger, and the animal no doubt believed me asleep. He probably saw the blankets on the ground, but I don't think he suspected the presence of the serpent.

When the tiger finally entered the opening and began to approach me I gave myself up for lost. With this feeling came that of coolness, and I was never more clear-headed in my life. For a moment I forgot the snake, but presently, as the tiger was within ten feet of the doorway, I heard the serpent utter a low hiss and move about. The tiger had eyes and ears only for me. He skulked over the ground exactly as you have seen a cat, making no more noise than a mouse. When he reached the doorway and stood with his fore paws on the threshold my heart stopped beating. His next move would be a spring, and he would find me helpless.

There was an interval of perhaps thirty seconds. My sight went away from me. I was half dead with terror. I faintly remember hearing a hiss and a snarl, and all at once I rose. It was to see the cobra and the tiger rolling over and over in the lane, and raising such a row that the whole village was aroused in a moment. I saw all the fight, but remember very little. Serpent and tiger rolled away down the lane and then back again, the one hissing like a steam engine and the other roaring and growling. In ten minutes it was over, and both were dead, and then I fainted away and was unconscious. The cobra had bitten the tiger in more than fifty places, and the tiger had used his teeth and claws to tear his enemy.

Gossip.

By Richard A. Proctor.

There is a good deal about America this month—partly in view of the approaching Presidential election. It will be seen from the two papers on American subjects that, while I take a more favourable view than did the late Mr. Matthew Arnold of American social traits and ways, I differ from him utterly in regard to America's political progress. Anything more utterly hopeless for the American nation than the outlook—unfortunately a far outlook—of American politics cannot well be imagined.

* * *

The worst days of political jobbery in England seem pure by comparison with political jobbery as it exists in America; and at present all the signs point to a darkening rather than a lightening in the gloomy cloud overhanging our Transatlantic cousins. Just now many in Great Britain are moved to wrath—which is commonly outspoken enough—against Irish obstructionism. But the interruptions to the nation's business, and the other annoyances arising from the Home Rule question, are simply as nothing compared with the way in which the Irish vote dominates both parties in the United States. The wrath of all true Americans is intense—but, under party domination which depends on Irish votes, that wrath is silent.

* * *

I had hardly sent off "copy" of my remarks on American politics, when I received the *World* for August 26, containing an account of an "interview" in which Sir John Macdonald, Premier of Canada, made the following remarks to a correspondent of that paper:—

American people would look better in the eyes of the world if, instead of "retaliating" (with special emphasis on the word), they made laws for the good of their country. It is a very poor business this retaliation—a literal rendering of the phrase, "Cutting off one's nose to spite one's face." It illustrates to my mind more forcibly than ever before *the wonderful and monstrous pitfalls which American politics lead to.* It is nothing more nor less than an exigency arising, not out of the relations of the United States with Canada and Canadians, but from the peculiar conditions of the two great political parties there and their respective determinations expressed in actions, not words, that *no matter how much the people are harmed, how foolish the country may appear in the minds of all*

thinking people, or what the consequence may be, this or that party is going to have its own way and elect its candidate by appealing to prejudice, and the party which makes the boldest moves will reap the richest reward at the polls.

* * *

What wonder if an English statesman, observing only events, and not recognising fully the utter rottenness of the American party system, remarked recently that there was more statesmanship in a college debating society than in the whole American Cabinet and in both Houses of Congress.

* * *

It would be a great thing for Canada if the policy of retaliation which has set the Democrats rejoicing, because they think it would secure the Irish vote, were to move the Dominion to take full advantage of the facilities which Halifax presents as the true port of entry not only for Canada, but for the northern and north-eastern States of the Union. The difficulties involved in making Halifax the chief distribution port are no longer what they were, and require only to be resolutely attacked to be overcome. When they are overcome, Canada *without retaliation*, but solely by the resolute development of her own advantages, will bring many dollars' loss on the States for every cent which the childish policy of "retaliation" may cost her.

* * *

Mr. Malet writes to me that I and another scientific editor have both sneered at his "Sunlight," without attempting to controvert his postulate that "Light is the dominant force in this Universe." I have not seen Mr. Malet's "Sunlight," but light is certainly not a force; it is a form of motion, and motion is a product of force.

* * *

A correspondent sends me the following from the *Daily Telegraph*:—

A Warning.—The Vicar of Midgham, Reading, writes:—"On Friday last a man in my employment, who was grass-trimming in my garden with a hook, took shelter under an elm tree during a heavy shower of rain, and I myself was taking shelter in a greenhouse close by. I can testify that there was not at the time, or near the time, any lightning or thunder seen or heard. When under the tree the man was employing his time in sharpening his hook, and whilst in the act of so doing, or at the moment he had finished, he heard, as he describes it, a hissing noise, and in an instant he was knocked against the tree, the sleeve of his shirt (his coat was off) was slit from top to bottom; his arm, the hand of which held the hook, was rendered powerless; the hook itself was completely doubled up; and there was a hole in the brim of his felt hat about the size of a florin. He has since recovered the use of his arm. I write this letter in the hope that you may think fit to insert it for the purpose of warning workmen against holding their metal tools in their hands when taking shelter whilst thunderstorms are prevailing, even if there should be nothing to indicate that there is one in close proximity to themselves. It may also have the effect of eliciting the opinion of some man of science as to whether the fact that the man was sharpening the hook with a whetstone would at all account for the discharge of *electric fluid*."

The case is curious, and, so far as I know, unique. By the way, why will newspaper science constantly speak of the Electric Fluid? They might as appropriately speak of heat as the Phlogistic Fluid.

* * *

I have received two very interesting communications in regard to my cipher, each suggesting an independent undecipherable cipher. One of these letters will appear in the present number of Knowledge, or in the next; the other is held over for a while. Oddly enough, the latter points out two unmistakable defects in my cipher when employed for long messages, both of which disappear when the suggestions in the former letter are adopted:—First, in long messages the letters indicating the lengths of the words differ too obviously in character from those belonging to the message; and secondly, in the last-mentioned letters the words like *the, and, but,* &c., which occur frequently, manifest their presence rather too plainly. In fact, my second correspondent shows that a long message in this cipher may be deciphered. But with the changes suggested by Mr. Anderson, my cipher is at once simplified and rendered (I think) altogether undecipherable.

* * *

A correspondent requests me to explain on what grounds I recently made the statement, in these columns, that the Man of Neanderthal was almost certainly speechless. The evidence consists in the absence of the chin tubercle—a small bony excrescence in which is inserted the muscle of the tongue. In place of this bone, the skull discovered in the cave of La Naulette shows a hollow, as is the case with the monkey's skull. Professor de Mortillet argues that "since speech is produced by movements of the tongue in certain ways, and these movements are mainly effected by the action of the muscle inserted in the genial" (or chin) "tubercle, the existence of the tubercle is essential to the possession of language. Animals," he proceeds, "which have not the power of speech, do not possess the genial tubercle. If, then, this tubercle is absent in the Naulette jawbone, it is because the Man of Neanderthal, the 'Chellean man,' was incapable of speech." Professor de Mortillet's logic is not quite perfect, for it does not exactly follow that, because animals which do not speak have no genial tubercle, animals without the genial tubercle cannot speak. Still, this cannot but be regarded as highly probable on this account alone; and, independently of the negative evidence given by the speechless animals, the importance of the genial tubercle for speech may be regarded as demonstrated physiologically.

* * *

Professor Max Müller considers the evidence decisive, fatal though it is to his own objections against the theory of man's evolution from a pithecoid ancestry. He accepts also as irrefragable the reasoning by which Lazar Geiger shows that man has not always been a rational animal. He contents himself by asserting that, independently of evolution, man has always been an animal capable of developing reasoning powers—*rationabilis* though not *rationalis*—striving to make more of the distinction than it is worth.

* * *

Kant long since dwelt on the distinction which Max Müller notes: "Man," says Kant, in his "Pragmatische Anthropologie," "was not always an *animal rationale*, but only an *animal rationabile*; he became rational through his own exertion, and chiefly through the two organs of his fashioning hand and his social language." But Kant recognised the possibility, which Müller denies, that the lower animals might be rationable also, and definitely anticipated the conclusions of recent science, that speech and the machinery of speech were developed, and that reason with the brain as an organ of reason were products of evolution. For he says, "under the influence of great evolutions of nature a new epoch may yet follow in which the ourang-outang and the chimpanzee might develop their organs of walking, grasping, and speaking, into the structure of man, and might develop an organ for the use of the understanding which should gradually become more perfect through social culture."

* * *

On which Professor Max Müller remarks: "I do not understand such possibilities, and they hardly seem to lie

within the sphere of practical philosophy"—a statement as to his grasp of modern biological problems which readers of his works, and even those who most enthusiastically admire him when working in his own sphere, must regretfully accept as true.

* * *

Sir,—I must protest against the paradoxical perversion of plain English perpetrated by Mr. Proctor on page 260 of Knowledge, where he tells his readers that in "The Fuel of the Sun" I describe "old Sol" as "constantly stirred up by centrifugal forces." What I actually do say respecting the stirring up of the solar atmosphere is all in chapter vi. of that work. Nowhere in that chapter does the expression "centrifugal force" occur, nor is the idea that centrifugal force is the stirring agent, either directly or indirectly, expressed, for no such idea ever entered my mind. How it has penetrated Mr. Proctor's is a psychological conundrum that I cannot answer. The force to which I do distinctly attribute the stirring up of the solar atmosphere is that which disturbing planets exert upon the body of the sun within it, a force which, as Airy says, "tends to pull the sun sometimes in one direction and sometimes in another." Anybody who will take the trouble to read the chapter in question must be as much surprised as I am at Mr. Proctor's grotesque misreading.—Yours &c., W. Mattieu Williams.

* * *

We understand that the Council of the Sunday Lecture Society have determined to give during the winter a course of twenty-one lectures in St. George's Hall, London, on Sunday afternoons, at 4 p.m., as in former years, beginning on October 21. While the lectures may be given to a slight extent what is understood as a more popular character; and, while theological and scholastic subjects will occupy a less prominent place in the programme than heretofore, the greatest pains will be taken to perpetuate the healthy, elevating, moral and intellectual tone which has always pervaded the lectures of the Society.

Reviews.

Handbook for the Stars. By the late H. W. Jeans, F.R.A.S. Fourth Edition. Revised by Staff-Commander W. R. Martin, R.N. (London: Longmans, Green, & Co. 1888.)—That notwithstanding the publication of so many maps, charts, planispheres, and handbooks for the stars, this work should have run through three editions during the lifetime of its author, and a fourth should be now demanded, offers a very tangible tribute to its excellence and to its suitability to the purpose for which it was originally devised. Especially does it address the navigator, whose use of the stars for observation with the sextant presupposes the knowledge which enables him to identify them. Captain Martin contributes an introductory chapter on the face of the sky generally, has carefully revised the work throughout, and has added three extremely legible maps of the entire celestial vault. The landsman who wishes to familiarise himself with the principal stars for purposes of recreation, alike with the sailor who seeks to learn their names to facilitate his astronomical observations, will alike find the "Handbook of the Stars" a useful companion.

Lingua: an International Language. By George J. Henderson. (London: Trübner & Co.)—"Volapük," the standard work on which we reviewed on p. 188, is obviously not to have it all its own way, for already there is a rival in the field in the shape of "Lingua." The remarks which we made on Mr. Kirchhoff's book, we may repeat, *mutatis mutandis*, in connection with Mr. Henderson's, the practical difference between them being that while the author of "Volapük" employs Teutonic root-forms largely in his new language, Mr. Henderson writes a kind of Latin somewhat akin to that in which *Punch's* schoolboy now and then so cleverly addresses the sage of Fleet Street. We are under an impression, well or ill founded, that this generation will pass away (and even conceivably a few dozen consecutive ones) ere this form of world-speech will become in the smallest degree common to mankind.

The Clyde, from its Source to the Sea. By W. J. Millar, E.C. (London: Blackie & Son. 1888.)—The topographer, the archæologist, the geologist, the mechanician, and last but not least, every "Glasca' mon" will welcome Mr. Millar's capital and most readable volume. The physical structure, topography and scenery of the Clyde valley are excellently described, and numerous artistic views agreeably illustrate that description. The rise of Glasgow in the eighteenth century and the story of its development into a mighty city are related in detail, while the description of the city of to-day forms in itself an excellent guide-book. The account of the rise and progress of shipbuilding on the Clyde forms a most enjoyable part of the volume, details of the construction of the earliest steamers furnishing matter of great interest to the mechanician. The ordinary reader even, innocent of any mechanical knowledge, can scarcely contrast the engraving of the section of the *Charlotte Dundas* (built in 1802) on page 163, with those of the sections of a modern ocean-going steamship on pages 228 and 229, without a feeling of surprise and admiration. An idea of the completeness with which the author has treated his subject may be gathered from the mention of the fact that the meteorology of the Clyde, the nature of its defences, and the history of yachting on it, form the subject of three chapters in the volume before us. We have already spoken of its excellent illustrations. We can conscientiously recommend it.

Another World; or, the Fourth Dimension. By A. T. Schofield, M.D. (London: Swan Sonnenschein & Co. 1888.)—Verily the doctrine of the existence of another world must be "in a parlous state" if it requires bolstering up by an appeal to the metageometrical vagaries of Lobatschewsky, Riemann & Co.; and yet it is pangeometry that Dr. Schofield invokes as a proof of the truth of Christianity! He quotes from that clever little skit "Flatland" with as much confidence as he might from Balfour Stewart's "Conservation of Energy," and as though the result of juggling with symbols of the pangeometers necessarily had some corresponding entity in the cosmos. How can he, or any other human being, assume the identity of an algebraic multiple with a spatial magnitude? We employ algebraic quantities of the first, second, and third degrees to denote geometrical magnitudes of one, two, and three dimensions respectively; and, *therefore*, say the fourth-dimension gentry (or must say if they consistently adhere to their own principles), there must be geometrical magnitudes of four, five, six and so on to n dimensions corresponding to algebraic quantities of the fourth, fifth, sixth, and n^{th} degree! For this, put nakedly, is every atom of evidence that we possess for the existence of "the fourth dimension." Try again, Dr. Schofield.

Geology for All. By J. Logan Lobley, F.G.S., &c. (London: Roper & Drowley.)—Marred by a certain dryness of style, Mr. Logan Lobley's volume yet contains an amount of rudimentary information sufficient to render it a really valuable introduction to the study of geology; and there can be, we think, but little doubt that its perusal will send its readers to such works as those of Page, Lyell, and

Geikie for more detailed information. The author has contrived to pack a quantity of useful and interesting matter into his 150 pages, and a capital index adds materially to the value of his book.

Electricity and Magnetism, by Thomas Dunman, revised and completed by Chapman Jones, F.I.C., F.C.S.; and *Sound, Light, and Heat*, by Thomas Dunman, revised and completed by Chapman Jones, F.I.C., F.C.S. (London: Ward, Lock, & Co. 1888.)—Having raised himself from a humble station, the late Mr. Thomas Dunman was to a considerable extent a self-taught man, and hence was able to appreciate the difficulties which beset the beginner in the study of physics, and to adapt his explanations to the needs of the incipient student. It is this which confers such value upon his rudimentary works. In the two before us this power of popular exposition is very apparent, and Mr. Jones has worthily supplemented the contents of the original works, while carefully correcting what was erroneous in them.

The Young Collector: British Birds and their Nests and Eggs, by W. Harcourt Bath. *Silkworms*, by E. A. Butler, B.A., B.Sc. (London: Swan Sonnenschein, Lowrey, & Co. 1888.)—These two volumes well sustain the reputation of the admirable series of which they form a part. The value of Mr. Bath's little book is materially enhanced by a capital chapter on "Bird-collecting and Stuffing," by Mr. Bowdler Sharpe, of the British Museum.

THE FACE OF THE SKY FOR OCTOBER.

By F.R.A.S.

IT seems possible that the actual minimum of sunspots has come to an end, but their apparitions are still very few and far between indeed. The zodiacal light may be seen before sunrise in the East. The October night sky is shown on map x. of "The Stars in their Seasons." Minima of the variable star Algol ("The Stars in their Seasons," map xii.) will occur at 1h. 8m. A.M. on October 5th, at 9h. 57m. P.M. on the 7th, at 6h. 46m. P.M. on the 10th, at 11h. 40m. P.M. on the 27th, and at 8h. 29m. P.M. on the 30th, and on other days and hours less convenient to the amateur observer. Mercury is an evening star all through October, but he sets too soon after the sun to be visible with the naked eye, and has too great south declination to be well seen in the telescope. *Mutatis mutandis*, these remarks apply to Venus too. As far as the rest of the planets are concerned, the night sky is practically a blank. Both Mars and Jupiter are close to the horizon at dusk. Saturn does not rise until midnight even in the third week of the month, and Uranus is in conjunction with the sun at 1 P.M. on the 18th. Neptune though may be found in a sufficiently powerful telescope, roughly half-way between the Hyades and the Pleiades ("The Stars in their Seasons," map xii.), by any one who knows exactly where to look for him. The moon is new on October 5th at 2h. 34·2m. P.M., enters her first quarter at 5h. 29·1m. A.M. on the 12th, is full at 9h. 8·9m. P.M. on the 19th, and enters her last quarter at 1h. 55·6m. A.M. on the 28th. In addition to the occultation of Saturn during the afternoon of the 1st, seven occultations of fixed stars by the moon will happen during October at hours convenient for the observer. With reference to Saturn, we may just say that he disappears at the bright limb of the moon at 3h. 59m. P.M. on October 1st at an angle of 110° from her vertex; but she will have set before his reappearance. On the 11th the 6½th magnitude star B.A.C. 6524 will disappear at the moon's dark limb at 8h. 35m. P.M. at an angle from her vertex of 72°. It will reappear at her bright limb at 9h. 17m. P.M., actually at the vertex of the moon. On the 12th B.A.C. 6889, of the 6th magnitude, will disappear at the dark limb at 7h. 53m. P.M. at an angle from the moon's vertex of 110°; reappearing at 9h. 6m. P.M. at her bright limb at a vertical angle of 311°. On the 13th 20 Capricorni, a 6th magnitude star, will disappear at the dark limb of the moon at 7h. 5m. P.M. at an angle of 153° from her vertex; and reappear at 7h. 55m. P.M. at her bright limb at an angle from her vertex of 240°. At 3 minutes to 1 in the early morning of the 16th 74 Aquarii, also of the 6th magnitude, will disappear at the dark limb at a vertical angle of 66°; reappearing 11 minutes later at the dark limb at an angle of 49° from the moon's vertex. On the 20th μ Ceti, a star of the 4th magnitude, will disappear at 11h. 39m. P.M. at the moon's bright limb at an angle of 63°. It will reappear at her dark limb 41 minutes after midnight, at a vertical angle of 338°. On the 24th χ^1 Orionis, of the 4½th magnitude, will disappear at the bright limb of the moon at 9h. 2m. P.M. at an angle of 39° from her vertex; to reappear at her dark limb at 9h. 56m. P.M., at an angle from her vertex of 264°. Lastly, before rising on the night of the 27th, the moon will have occulted the 6th magnitude star B.A.C. 2854. After she has risen it will reappear at her dark limb at 10h. 51m. P.M., at a vertical angle of 239°. When our notes begin she is on the confines of Cancer and Leo, entering the last-named constellation at 2 o'clock this afternoon ("The Seasons Pictured," plate xxiv.). She is travelling through Leo until 4h. A.M. on the 4th, when she leaves it for Virgo ("The Seasons Pictured," plate xxv.). Her passage across Virgo occupies her until 3h. 30m. A.M. on the 7th, at which hour she enters Libra ("The Seasons Pictured," plate xxvi.). As she journeys across Libra, she arrives, at 7h. P.M. on the 8th, at the western edge of the narrow northern spike of Scorpio. By 3h. 30m. the next morning she has crossed this, and come out in Ophiuchus. She remains in Ophiuchus until 3h. P.M. on the 10th, and then quits it for Sagittarius. By 10h. P.M. on the 12th she has traversed Sagittarius and entered Capricornus ("The Seasons Pictured," plate xxi.). At 9h. P.M. on the 14th she passes from Capricornus into Aquarius; leaving Aquarius in turn for Pisces at midnight on the 16th ("The Seasons Pictured," plate xxii.). Traversing Pisces, she enters, at 8 P.M. on the 17th, the northern part of Cetus, coming out again into Pisces at 3h. A.M. on the 19th. She, however, plunges once again into the most northerly part of Cetus at 2h. A.M. on the 20th, and when she finally quits this constellation at 3 o'clock that afternoon it is to enter Aries ("The Seasons Pictured," plate xxiii.). At 9 P.M. on the 21st she passes from Aries into Taurus. Traversing Taurus, she, at 9h. 30m. P.M. on the 24th, reaches the northern extremity of Orion. By 7 o'clock the next morning she has crossed this and emerged in Gemini ("The Seasons Pictured," plate xxiv.). She is travelling across Gemini until 7h. A.M. on the 27th, when she enters Cancer. She remains in Cancer until 11h. P.M. on the 28th, when she leaves it for Leo. She does not complete her passage across Leo until 2h. P.M. on the 31st, when she crosses into Virgo ("The Seasons Pictured," plate xxiv.). She is of course in Virgo when our notes terminate.

Land and Sea.—At a meeting of the Royal Society of Edinburgh, Dr. John Murray, of the *Challenger* expedition, made a communication on "The Height and Volume of the Dry Land and the Depth and Volume of the Ocean." According to his own investigations, *Engineering* says, the mean height of the land of the globe was 2,230 feet above the sea level, and the mean depth of the ocean was 12,480 feet, or 2,080 fathoms. If the ocean were regarded as being divided into two parts by the 1,000 fathom line, it would be found that the mean depth of the area having less depths than 1,000 fathoms was 2,028 feet, or 338 fathoms, or nearly the same depth beneath the sea as the height of the dry land above it. On the other hand, the mean depth of the area beyond the 1,000 fathoms is 14,640 feet, or 2,440 fathoms. The former area—called by Dr. Murray the "transitional area"—occupies 24,000,000 square miles; and the latter area, which is the abysmal area, and is situated fully three miles below the average heights of the continents, occupies 113,000,000 square miles, or more than half of the surface of the earth. In the transitional area of the ocean there are many and varied conditions in respect of light, heat, currents, changes of level, the character and variety of the deposits, and in the animals and plants which inhabit the various parts of the region. The deposits are in most respects similar to those which make up a very large part of the sedimentary formation of the dry land. In the abysmal area there is a uniform set of conditions, the temperature being near the freezing-point, with an annual range not exceeding 7° Fahrenheit, and there being no sunlight or plant life. There is a great abundance of animal life, but the forms from various parts of the area are very similar, and unlike those of shallower waters, and the deposits which accumulate slowly are unlike any of the sedimentary deposits of the dry land. From Dr. Murray's investigations, it also appears that if the dry land of the globe was reduced to the sea level by being removed to and piled up in the shallower waters of the ocean, then its extent would be about 80,000,000 square miles, and the rest of the surface of the earth would be covered by an ocean extending to 113,000,000 square miles. Again, should the whole of the solid land be reduced to one level under the ocean, then the surface of the earth would be covered by an ocean with a uniform depth of about two miles.—*St. James's Gazette.*

XUM

Our Whist Column.

By "Five of Clubs."

A CORRESPONDENT, who evidently takes great interest in whist, asks—but in a very different spirit from Mr. "F. Ram's"—whether it is really possible for any, except the very best whist-players, to take such account of the cards played to the several tricks in each game as to be able to carry out such strategic manœuvres as have been recommended from the days of Mathews to those of Cavendish. He seems to think that such play as we find in the ten or a dozen best games of the set of forty in my own "How to Play Whist" must be artificially devised, and could never have been actually played over the table.

The idea is a very natural one; and I have known even good whist-players judge in that way of the recorded games in which the fine play of Lewis, Clay and others has turned the balance in favour of "strategy" and against "cards"—until, perhaps, in the course of the very evening on which such an opinion has been expressed, the player who has expressed it has had his attention called to his own fine play in some game just finished. Then he notices that the very turn of strategy which in some one else's game had seemed to him an incredibly recondite matter has been played by himself almost as by instinct—though when asked why he so played, he has found that it was because, "Of course he remembered B's playing so and so to one trick and Y something else to another, and Z in such and such a way to a third."

The real fact is, that the scientific game in which men have a reason for every card they play, and consider their partner's and their opponent's cards as also played with some sufficient reason, impresses the cards played on the minds of the several players simply because of the interest which the game has for them. They attend to particular indications as they arise. Moreover, be it noticed that they do not so much remember the cards which have been played as their inferences respecting the position of the cards which have not been played. It is on these, not on those, that the strategy of the game depends, and these therefore are remembered—just as practicable gates, hedges, ditches, &c., are remembered by the fox-hunter, to which the ordinary rider (not likely to have occasion to use them) pays little attention. [I might have added "just as Wellington's keen eye noted for possible future use the strategic qualities of Torres Vedras and of the roads leading towards Soignies;" but the average whist-player might answer that whist-Wellingtons may be as scarce as Wellingtons like him who triumphed at Waterloo; Americans, by the way, who regard Grant—really third rate to their own best, Lee, who was nearly as great a soldier as Soult or Davoust—as far superior to Wellington.] Here is a game in which I took part, and in which not only I noted the fall of every card so that I could have reproduced the game afterwards (every whist-player will find that that is easy, if he will only try it); but I was so interested in a little strategic plan (perhaps rather lively than sound) occurring to me at the very beginning and successfully carried out, that I had the clearest *aperçu* of the position of all the cards, not from the beginning (that never happens) but early enough to take advantage of each several point as opportunity to do so required. More, I think, is seldom managed, and at any rate more is never needed, even in the finest play:—

I was second hand, Y; my partner, Z, had turned diamond three; and I found in my hand—ace, queen, nine, and two of diamonds (*trumps*); ace, five, four, three, and two of clubs; king and a small heart; queen and a small spade. The score was "love all":—

A led club king. My safest course was probably to play the ace, lead trumps, and trust to the chapter of accidents to establish and bring in clubs. But it occurred to me to make a bold shot for "game." I do not myself admire the modern conventions, regarded as they bear on the quality of whist *as a game*; but all at the table used them, and "in Rome," &c. &c. I knew A had led from club king, queen, to four at least; if I now began a signal for trumps instead of taking the trick his next lead would almost certainly show whether he had led from four or more—my partner would get a chance of making a small club; moreover, I should learn whether B, my opponent on the left, held five trumps, for he was an inveterate leader and signaller from that number (following Pole's most unsound doctrine).

A followed with club six, his original lowest (as my own hand showed); therefore he had only held four. B followed my deuce with the nine, having at the first round played the seven, so he certainly did not hold five trumps; and my partner, who had at the first round played the eight, took the trick with the ten. Now, interested as I was in my little scheme, I could not but note, nor could I afterwards forget, that the remaining clubs lay between my opponent A and myself, he having still command, since he held queen, knave to my ace; but I holding length. I had signalled for trumps, and was interested to know how my partner stood in them. He led the deuce, showing me at once that he held four, since had he held two or three only he would have led the highest, whereas the trump card was the three and he had led the two. If one of his higher trumps was an honour our chance for "game" was good. On my left A played the knave, I of course finessed the queen, and B played a small card.

My original plan did not lead to my continuing trumps. I knew that my partner would surely place the ace of clubs in my hand, and so would understand my plan at once if I led a little club; whereas B would as surely place the ace in Z's (my partner's) hand; since although passing king first round is not very unusual (seldom right, however), omitting to play it second round—except in Z's position, fourth in hand, with a winning smaller card—is scarcely ever seen. Naturally, B trumped with his smallest—if he had trumped with his best, the ten, he would have captured the trick—my partner overtrumped with a little one, and A's club knave fell.

My partner led trumps again, A played king, I ace, and B followed with his third and last trump, the ten.

We had now made four tricks, A-B one, and required all the remaining tricks except one—that is, six more tricks—to win the game, since honours were easy. But I had in my hand ace and a small club, both sure tricks, and two trumps; my partner had also a trump left. Sure of making four, and almost sure of making five tricks, I led club ace to give my partner a discard, who played a small spade. It then seemed to me best to go on with the small club, to which Z discarded another spade. On the heart king B put the ace, and led spade ace, which my partner trumped. He then led the winning heart (the queen), and the remaining tricks fell to my two last trumps. We made five by cards.

The game was not in any way remarkable, but it interested me from first to last; and the interest I took in the development of my plan enabled me to follow without difficulty the fall of all the cards from the beginning. I think it is so always. Of course those who play without a plan have fifty-two cards to remember without any help; and that is not an easy thing to do.

Had I played on the more usual lines, we should barely have made the odd trick. (I am not able to place all the cards in hearts and spades between A and B; for as my plan crowded them out—except the ace of hearts—in the actual game I took little notice how they fell—but as nearly as I can place them, A held king, knave, and three small spades—B holding heart, ace, knave, ten, and two small ones.)

The game would have run somewhat as follows had I played my club ace first round—which, in reality, was the more prudent course:—

A	*Y*	*B*	*Z*
1.—C K	C A	C 7	C 6
	—1—		
2.—D Kn	D 5	D 4	D 8
—1—			
3.—C Q	C 2	C 9	C 10
—2—			
4.—S 3	S 4	S A	S 5
		—3—	
5.—H 8	H 3	H A	H 2
		—4—	
6.—S K	S Q	S 6	S 10
—5—			
7.—S Kn	D 9	S 8	H 4
	—2—		
8.—C 8	C 3	D 10	D 2
		—6—	
9.—S 2	H K	H 5	H 6
	—3—		
10.—C Kn	C 4	H 7	D 3
			—4—
11.—D K	D A	H 10	H Q
	—5—		
12.—S 7	D Q	D 6	D 7
	—6—		
13.—S 9	C 5	H K2	H 9
	—7—		

Still, by not playing the club ace, I ran the risk of helping the enemy's game. I might have found A or B with length in trumps to back up A's clubs, B with but a single club, so that after B had ruffed the second round A could force out my club ace with his queen (having still the knave) for B to ruff, and our game thus seriously compromised. The question is—Was the chance of game, combined with the practical certainty which my holding two honours gave that we could not lose the game, sufficient to justify taking a little risk?

RECORD OF SCORES IN HOME WHIST.

Many prefer to put a price on the points at whist, because the game is then better and more strictly played, while many prefer to play for money because, without such incentive, the game itself has no interest for them; only a few love whist so well for its own sake that merely keeping a score suffices to give the play all the interest which rivalry can add to it. I should be rather sorry if I thought my "Notes on Whist" here were intended for any but the real lovers of the game as a scientific and improving amusement. I want to see home whist improved and made the really good game it can be made. For this the degradation of playing for money is not essential, though while whist is made the dull stupid game too often seen in the domestic circle, no one can expect the game itself to be held worth the trouble of sitting down to for its own sake. Let the true game be learned and a full score kept, and it will replace, I venture to say, all other home games for four. The score should be kept in such a way that its results can always be presented in the following form:—

Name.	Games played.	Points won.	Rubbers won.	Cards Exposed.	Led out of turn.	Revokes.
A.	92	99	41	5	1	1
B.	92	80	35	7	3	2
C.	92	105	45	1	0	0
D.	92	86	39	3	2	0

Those who play in this way will not only find the interest of the game increased, and the scientific quality of the play improved, but, unless I mistake, they will recognise the folly of the ideas of luck, vein, change of luck, &c., which gamblers entertain. For instance, the absurd notion that a run of luck one way is sure to be followed by a run of luck the other way, will be seen to be an entirely false way of presenting the real fact; this, namely, that—in the long run of a great number of games between players of equal skill the proportion of the number of games won by any given player to the number won by any other player will be very near equality. Thus, if A, B, C, D, players of equal skill, play whist together, and, after a certain short time has elapsed, A is forty games behind B, it may very well be B has won twice as many games as A; that is, B may have won eighty games to A's forty. Now if A imagines that because he is forty games behind B he is likely to win a larger number of games out of the next eighty he labours under a delusion; B has quite as good a chance as A of winning the majority of the next eighty games. Nor is it at all certain, or even antecedently likely, that A will reduce his loss of forty games greatly, however long he may play. What is almost certain is, that if A, B, C, D continue playing for a very long time the ratio of the number of games won by A to the number of games won by B, instead of being one to two, as at the early stage considered, will be very nearly as one to one. Thus, if they play 10,000 games, B might be more than 40 ahead of A—say, for instance, 100 ahead, yet the ratio of games would in this case be 4950 to 5050, or 99 to 101—pretty near to equality.

HOW TO ASCERTAIN THE TEMPERATURE AND PHYSICAL CONDITIONS OF ENSILED FODDER, &c.

Messrs. Dollond & Co., of 1 St. Paul's Churchyard, have recently introduced a contrivance, which certainly ought to command the serious attention of agriculturists throughout the world. The instrument is simple enough. It consists of a hollow tube of iron left open at one end, and barbed and drawn to a point at the other extremity, in such a way that when a thermometer is introduced into the central hollow of the tube, its bulb rests immediately beneath the notch at the pointed end, whilst a slit along the tube enables a reading to be taken at any time without removing the thermometer. A handle may now be fastened to the open end of the tube, and the whole can thus be easily thrust into any desired part of the stack or contents of the silo. After a lapse of about five minutes the instrument should be withdrawn, when the barb will come into action and bring away a good sample of the fodder, whilst the thermometer will of course indicate the exact temperature of the part from which the sample was taken. In this way the farmer can readily ascertain whether everything is as it should be; and if not, he is at once in a position to rectify matters before it becomes too late. The instrument is also of the utmost value to the practical gardener, to enable him to ascertain the temperature of hot-beds and soils out of doors when they are variously fortified, as with stable sweepings, guano, &c. In the latter instances he can at once judge of their suitability for the growth of stated kinds of plants. As the instrument is made out of iron it is not liable to sudden variations on account of its relatively low conductivity, and the thermometric results can therefore be depended upon. We may therefore compliment Messrs. Dollond on having produced an article which ought to find a place amongst the tools and appliances of every intelligent agriculturist and gardener.

Our Chess Column.

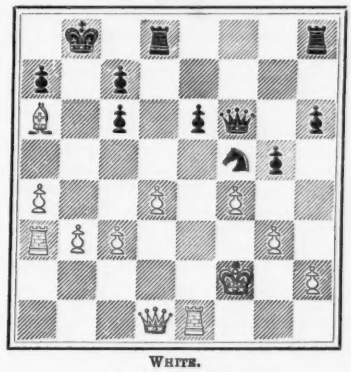
By "Mephisto."

In Memoriam.

The sad news of the sudden death of Mr. Proctor has come with a great shock upon the chess world. It is no exaggeration to say that every chess-player feels that he has suffered a great personal bereavement by that most deplorable event. The chess community has lost a most devoted and enthusiastic player, and the world of genius one of its brightest ornaments. May he rest in peace.

The following ending occurred in a game played by correspondence between Mr. R. A. Proctor and Mr. J. Gunsberg:—

J. GUNSBERG.
Black.



White.
R. A. PROCTOR.

White won as follows:—

White. R. A. P.	Black. J. G.	White. R. A. P.	Black. J. G.
22. Q to B3	R to Q3	37. K × R	Q to Ksq (ch)
23. R to K5 !	K to Rsq	38. Q × Q	Kt × Q
24. R to Kt5	R to QKtsq	39. K to B2	Kt to B3
25. R × R (ch)	K × R	40. K to B3	Kt to Q4
26. R to R2	P × P	41. B to B4 !	Kt × P
27. R to K2	Kt to K6	42. K × P	P to QR4
28. P × P	Kt to Q4	43. K to B5	Kt to Kt8
29. P to KB5	P × P	44. P to R4	Kt to Q7
30. R to K5	P to B5	45. B to Q5 !	Kt to B8
31. Q to R3	Q to Qsq	46. K to Kt6	Kt to K6
32. Q to R5 !	Kt to B3	47. B to K4 !	Kt to Kt5
33. Q to K2	Q to KBsq	48. P to R5	K to R2
34. Q to B3	R to Q4	49. B to B5	Kt to K6
35. K to Bsq !	R × R	50. B to K6	Resigns.
36. Q × QBP !	R to K8 (ch)		

"PIERCE GAMBIT CHESS PAPERS AND PROBLEMS."*

The volume before us contains an analysis of Pierce's Gambit, a few essays on subjects incidental to chess playing, some poetry, and 135 problems, the joint production of Messrs. J. and W. T. Pierce. We were first of all curious to know what the Pierce Gambit is, and found that it consists of a variation of the Vienna game, *i.e.*, 1. P to K4, P to K4; 2. Kt to QB3, Kt to QB3; 3. P to B4, P × P; 4. Kt to B3, P to KKt4; 5. P to Q4. This move constitutes the Pierce Gambit. Before proceeding to further illustrations of this variation, we cannot help giving expression to some thoughts which crowd in upon us at this moment. Here is a variation which we will say, for argument's sake, contains some beautiful moves, and enables imagination to take high flight in devising attack and counter-attack of the most brilliant and ingenious character. But unfortunately (as analysis stands at present) the opportunity to play this variation should never arise, for in reply to 1. P to K4, P to K4, 2. Kt to QB3, most players consider Kt to KB3 a stronger reply than Kt to QB3, and by Black playing Kt to KB3 all this ingenuity is wasted, is impossible, and if it is any consolation to the authors, they may derive it from the fact that the celebrated Steinitz Gambit, also contingent on Black

* Trübner & Co., Ludgate Hill.

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replying with 2. Kt to QB3, shares the same fate. The questions we should like to ask are:—Is it wrong for Black to play the stronger move of 2. . . . Kt to KB3? Is he a barbarian if he does not play the weaker defence of 2. Kt to QB3, submitting himself to those various beautiful attacks (not least among which we mention the Fyfe Gambit, which consists of White playing 3. P to Q4)? Is it not of more importance, and of greater value to the game, to discover a good reply to the move of Kt to KB3? If that move be discovered, and imagination then once more obtains free play, will it not of necessity lead to finer and purer, more beautiful and ingenious play, in proportion as the task of overcoming the correct move is more difficult, requiring greater ingenuity, than the various combinations against the weaker move? Would it not be unnatural and unsound for Black to play any but the correct move? Is not, therefore, correctness of high importance, giving scope, and leading up to creations of the imagination of the purest and highest order? and so forth. These questions are not by any means advanced in disparagement of the author's work, but mainly as an argument against the assertion of some players, that modern soundness has destroyed all imaginative play. The contrary is the case, and no one has shown better how Steinitz, the apostle of the modern school, can be beaten than Steinitz himself.

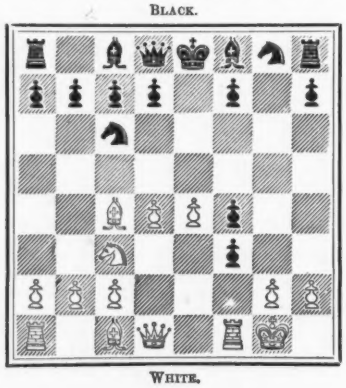
Thus the French defence was anathematised by many as being of a deadly dull character. Steinitz in a beautiful game against Golmayo, which we published some time back, proves that imagination knows no obstacle, the only difference being that whereas Messrs. Pierce may brilliantly overcome a weaker defence, it takes a Steinitz to overcome the stronger and sounder play, and given a player gifted with a sufficiently strong imagination, he will have no difficulty in overcoming that part of Steinitz's play which consists of what is supposed to be a sound and invulnerable defence. We are therefore forcibly led to the conclusion that soundness and imagination must be interdependent: the greater the one the greater the other.

We cannot do better than give the main play of this gambit, abounding in many variations constructed with an ingenuity creditable to the authors.

1. P to K4, P to K4. 2. Kt to QB3, Kt to QB3. 3. P to B4, P × P. 4. Kt to B3, P to KKt4. 5. P to Q4.

This move is played for the purpose of bringing about an old form of the Muzio Gambit, in which White would have the advantage of having his QKt in play, whereas Black is hampered by having to lose time whenever a White P on Q5 attacks the Black QKt. Therefore, as a matter of course, the main play arises when Black follows up by bringing about the desired position with 5. . . . P to Kt5. 6. B to B4, P × Kt. 7. Castles.

Position of the White's seventh move.



Amongst the replies for Black the authors give—(*a*) P to Q3, (*b*) P to Q4, (*c*) Kt × P, (*d*) Q to Kt4, (*e*) Kt to K4, (*f*) Q to B3, (*g*) P × P, (*h*) B to R3, (*i*) B to Kt2. The last four are summarily dealt with as unsatisfactory, but to the first five the authors devote a separate chapter to each.

(*a*) 7.	. . . .	P to Q3
8.	Q × P	B to K3.

Here the authors might, with advantage to the general reader, have pointed out how they intend proceeding if Black adopts the very suggestive move of 8. . . . . Kt × P.

9.	B × B	P × B
10.	B × P	Q to B3
11.	P to K5	Q to Kt3
12.	P × P	P × P
13.	P to Q5	

And the authors say White has a considerable attack left.

(*b*) 7.	. . . .	P to Q4
8.	P × P	B to KKt5
9.	R to Ksq (ch)	KKt to K2
10.	Kt to K4	B to Kt2
11.	P × P	Kt to R4
12.	B to Bsq	B to R4
13.	P to B4	R to KKtsq

Again, the authors fail to say why Black should not Castle.

14.	K to B2	
(*c*) 7.	. . . .	Kt × P
8.	QB × P	

Amongst the large number of interesting sub-variations, the one arising here is noteworthy. Thus, 8. Q × Kt, Q to Kt4; 9. R to B2, B to B4, &c.

8.	. . . .	Q to B3
9.	B to K3	B to B4
10.	Kt to Q5	Q to Kt2
11.	R × P	Kt × R (ch)
12.	Q × Kt	B × B (ch)
13.	Q × B	K to Qsq
14.	R to KBsq	

and the authors carry out the variation in White's favour, though it is very doubtful whether this is a forced conclusion.

(*d*) 7.	. . . .	Q to Kt4
8.	R × P	Kt × P
9.	B × P (ch)	K to Qsq
10.	R × P	B to B4
11.	K to Rsq	P to Q3
12.	P to QKt4	B to Kt3
13.	P to K5	Q × KP
14.	R to K4	Q to Kt2
15.	R to K8 (ch)	K to Q2
16.	Q to R5	Kt to KB3
17.	Q to R3 (ch)	K to B3
18.	P to Kt5 (ch)	Kt × P
19.	Q to B3 (ch)	K to B4
20.	Kt to R4 (ch)	K to Kt5
21.	B to Q2 (ch)	K × Kt
22.	Q to Kt3 mate	
(*e*) 7.	. . . .	Kt to K4
8.	P × Kt	B to B4 (ch)
9.	K to Rsq	P × P (ch)
10.	K × P	P to Q4
11.	Q × P	Q × Q
12.	P × Q	Kt to R3
13.	B × P	R to Ktsq (ch)
14.	B to Kt3	Kt to B4
15.	B to Kt5 (ch)	K to Qsq
16.	Kt to K4	B to K2
17.	P to Q6	

and White has the advantage.

It is not necessary to go into the details of all the variations given. The authors may, however, fairly claim that, broadly speaking, they have established the fact that their gambit is as good as any gambit when White gives up a piece, and that the attack arising from that line of play is very strong, and should satisfy any one desiring a bold game. The remainder of the book is readable, and the problems all fairly good.

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